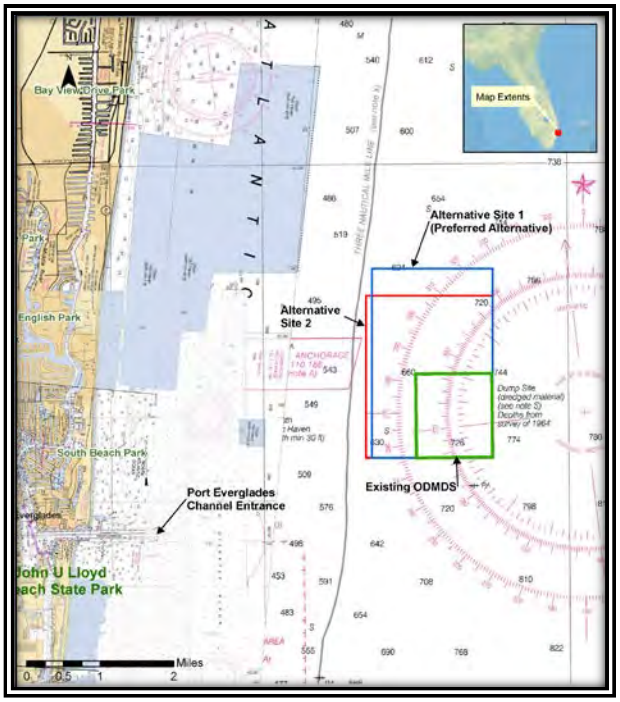
# DRAFT ENVIRONMENTAL ASSESSMENT
# ON THE
# EXPANSION OF THE PORT EVERGLADES HARBOR
# OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)
# BROWARD COUNTY, FLORIDA




**Lead Agency: U.S. Environmental Protection Agency, Region 4**

**Cooperating Agency: U.S. Army Corps of Engineers, Jacksonville District**

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**July 2013**

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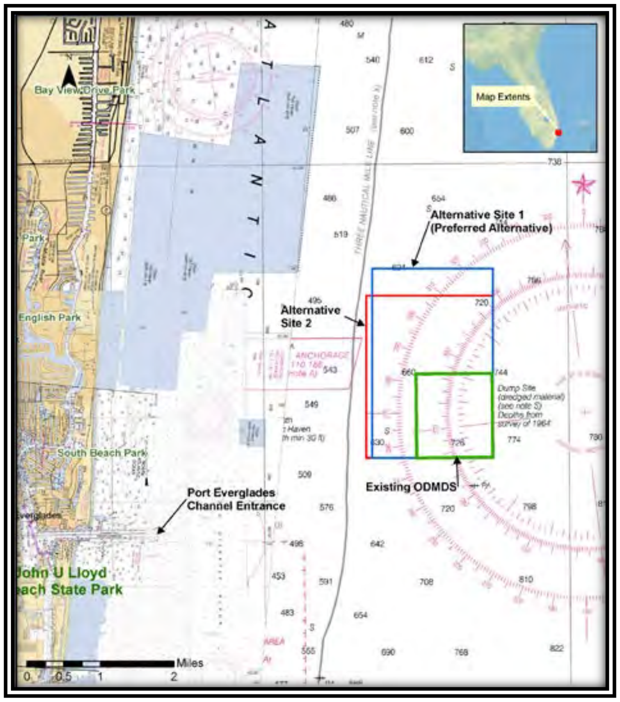


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United States Environmental Protection Agency

**U.S. EPA Region 4**
**61 Forsyth Street, SW**
**Atlanta, GA 30303**

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**U.S. Environmental Protection Agency**
**Region 4**
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Comments must be received no later than:

30 days after publication of the notice of availability in the Federal Register for the Draft Environmental Assessment.

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## 1 PROJECT PURPOSE AND NEED

### 1.1 PROJECT AUTHORITY

#### 1.1.1 Initial Authorization

The Administrator of the U. S. Environmental Protection Agency (USEPA) has the authority to promulgate ocean dumping criteria, designate recommended ocean disposal sites, and issue permits for dumping of materials into ocean waters. Under Sections 102 and 103 of the *Marine Protection, Research, and Sanctuaries Act (MPRSA)* of 1972, as amended (33 U.S.C. 1412), also known as the *Ocean Dumping Act,* USEPA and the U. S. Army Corps of Engineers (USACE) have the responsibility for ensuring that ocean dredged material disposal activities will not unreasonably degrade or endanger human health, welfare, amenities, or the marine environment.

Section 102 of the MPRSA authorizes USEPA to designate sites or times at which dumping may occur and establish criteria for reviewing and evaluating permit applications. It also requires USEPA, in conjunction with USACE, to develop site management and monitoring plans (SMMPs) for dredged material disposal sites. Section 103 of the MPRSA authorizes USACE to issue permits for the transportation of dredged material, subject to compliance with the USEPA environmental criteria (Ocean Dumping Criteria at 40 CFR Part 227) and USEPA concurrence with USACE's finding of compliance. Section 103(b) authorizes USACE, with USEPA concurrence, to select alternative project sites of limited duration for disposal of dredged material in ocean waters when the use of a site designated by USEPA is not feasible.

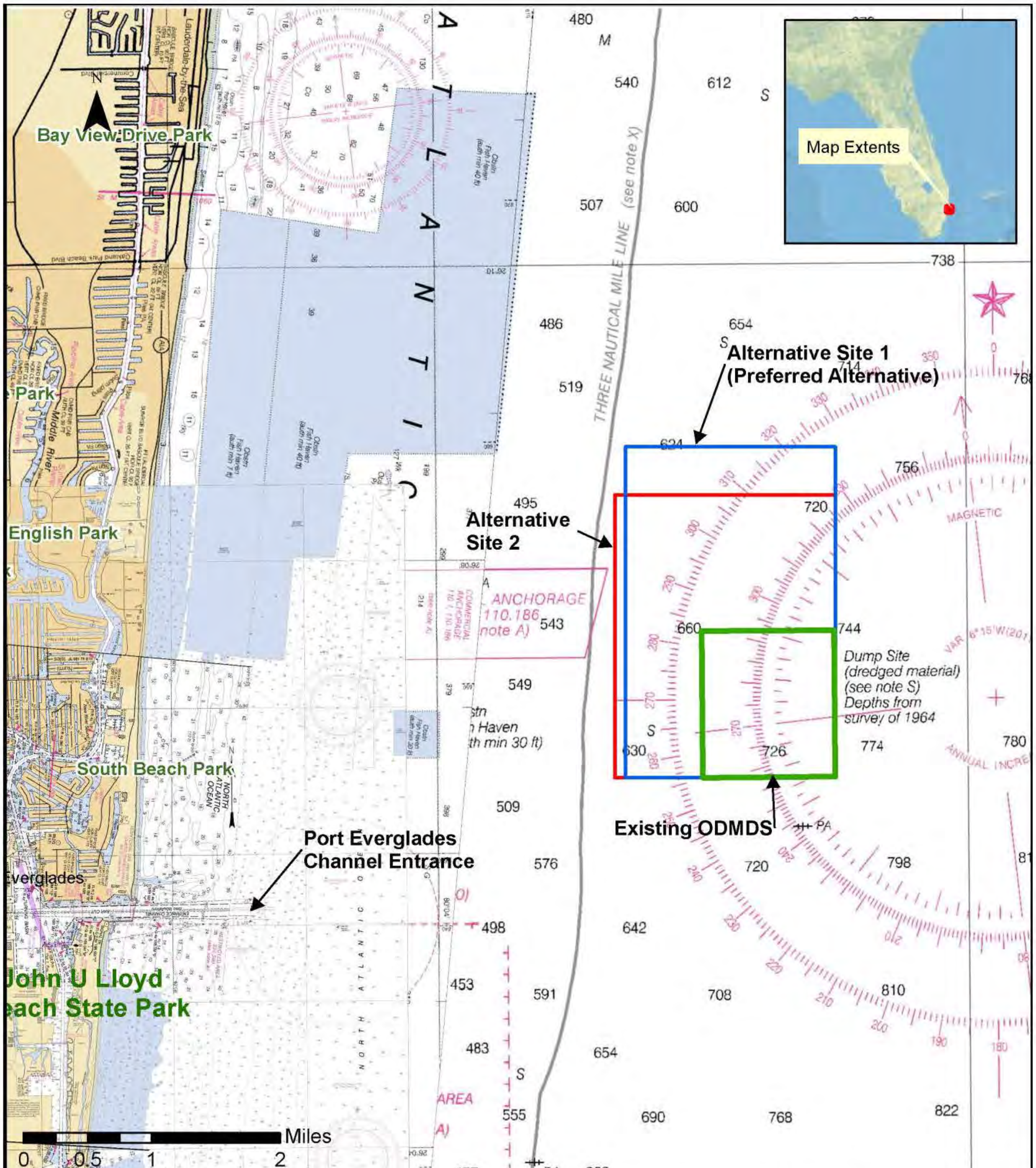
It is the USEPA's policy to prepare a *National Environmental Policy Act (NEPA)* document for all Ocean Dredged Material Disposal Site (ODMDS) designations (63 FR 58045, October 1998). The Port Everglades Harbor ODMDS was designated by USEPA Region 4 in February 2005 (70 FR 2808, 1/18/2005). A Final Environmental Impact Statement (FEIS) in support of designation was published in July 2004. The November 2004 Port Everglades Harbor ODMDS SMMP placed project volume restrictions of 500,000 cubic yards (cy) per dredging event until capacity modeling was completed. In 2009, the USACE initiated capacity modeling for the proposed Port Everglades expansion project. Preliminary results have indicated that the existing ODMDS is insufficient in size to contain the potential volume of dredged material from this project. Therefore, the USACE has determined that there is a need to enlarge the existing ODMDS and is working cooperatively with the USEPA in the development of an Environmental Assessment (EA) supporting the ODMDS expansion. Per the regulations at 50 CFR 1502.20, EPA is tiering the NEPA analysis associated with the expansion off of the 2004 EIS for designation of the original site. The regulations state that the federal agency shall tier "to eliminate repetitive discussions of the same issues and focus on the actual issues ripe for decision at each level of environmental review."

#### 1.1.2 Supplemental Appropriation

There is no supplemental appropriation for this project.

## 1.2 PROJECT LOCATION

The project is located east northeast of Port Everglades and approximately 3.25 nautical miles (nmi) (6.0 km) offshore of Fort Lauderdale, Broward County, Florida (Figure 1). Water depths at the project site range from 604 ft. (184 m) to 735 ft. (224 m). The Alternative sites and existing ODMDS are defined by the boundary coordinates presented in Table 1.




| US Army Corps of Engineers® Jacksonville District | **PROJECT VICINITY MAP** Port Everglades ODMDS Expansion Areas *NOAA Raster Nautical Chart - Seamless Mosaic - ESRI Server* | Figure: 1 |
|---|---|---|
| | | Date: November 2012 |
| | | Scale: 1:60,000 |
| | | Source: NOAA/ESRI/GEC |

**Figure 1. Project vicinity map showing the location of the two proposed alternatives, the existing ODMDS, and the entrance to the Port Everglades channel.**

**Table 1. Coordinates and total area in square nautical miles (nmi$^2$) for the existing Port Everglades ODMDS and Proposed Alternative Sites 1 and 2.**

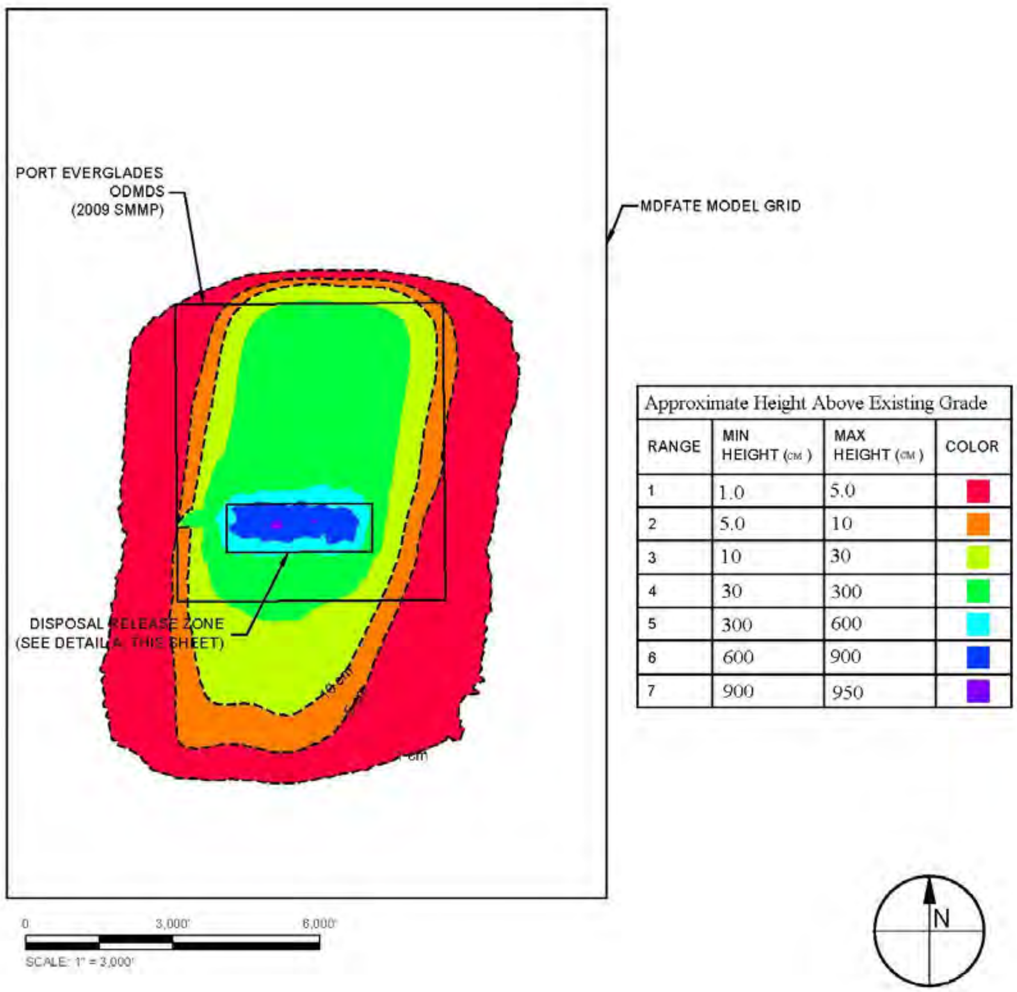
| Site | | Geographic (NAD83, Decimal Degrees) | | State Plane (Florida East NAD83) | | Area nmi$^2$ |
|---|---|---|---|---|---|---|
| | | Latitude | Longitude | N | E | |
| Existing ODMDS | Center | 26°07.000’ | -80°01.500’ | 649292.40 | 976098.20 | 0.90 |
| | SE | 26°06.500’ | -80°01.000’ | 646284.00 | 978856.00 | |
| | SW | 26°06.500’ | -80°02.000’ | 646243.00 | 973386.00 | |
| | NW | 26°07.500’ | -80°02.000’ | 652301.00 | 973341.00 | |
| | NE | 26°07.500’ | -80°01.000’ | 652342.00 | 978810.00 | |
| | | | | | | |
| Alternative Site 1 | Center | 26°07.625’ | -80°01.784’ | 653067.18 | 974516.67 | 3.21 |
| | SE | 26°06.493’ | -80°01.000’ | 646242.90 | 978855.70 | |
| | SW | 26°06.504’ | -80°02.586’ | 646242.90 | 970178.00 | |
| | NW | 26°08.756’ | -80°02.568’ | 659889.00 | 970178.00 | |
| | NE | 26°08.746’ | -80°00.981’ | 659889.00 | 978855.70 | |
| | | | | | | |
| Alternative Site 2 | Center | 26°07.464’ | -80°01.825’ | 652090.13 | 974299.72 | 2.89 |
| | SE | 26°06.493’ | -80°01.000’ | 646242.90 | 978855.70 | |
| | SW | 26°06.504’ | -80°02.666’ | 646242.90 | 969745.00 | |
| | NW | 26°08.434’ | -80°02.650’ | 657932.00 | 969745.00 | |
| | NE | 26°08.423’ | -80°00.984’ | 657932.00 | 978855.70 | |

## 1.3 PROJECT NEED OR OPPORTUNITY

Port Everglades is a major cargo and cruise ship port in Florida contributing $14 billion of economic activity to Florida’s economy and nearly 10,000 jobs via the companies that provide direct services to the Port (http://www.porteverglades.net/about-us/). With the work well underway to enlarge the Panama Canal, larger ships are currently calling on Port Everglades, albeit light-loaded, and are not able to fully maximize their full capacity due to the channel depth limitations. In order to allow these vessels to fully maximize their capacity, the USACE is preparing a Congressionally authorized feasibility study and draft Environmental Impact Statement (DEIS) for dredging and expansion activities at Port Everglades. The proposed expansion would deepen the entrance channel from -45 feet to -57 feet mean lower low water (MLLW) (plus up to two feet of required and allowable overdepth) and to deepen all other channels to -50 feet MLLW (plus up to two feet of required and allowable overdepth) (USACE, in press).

The project is expected to dredge material from six areas: the Outer Entrance Channel, Inner Entrance Channel, Main Turning Basin, Widener, Southport Access Channel, and Turning Notch. Depending on the selected plan, volumes of dredged material for ocean disposal will not exceed 6.63 million cubic yards (mcy). The composition of the dredged material varies. Due to previous dredging projects, some of the project area consists of exposed rock. Shoaling has covered some localized areas with a few feet of sand. Silts and clays overlay medium and fine sand, coupled with limestone and sandstone, in areas not previously dredged. Borings indicate likely dredged material compositions of 12% clay and silt, 33% limestone and sandstone gravel, 25% silty fine sand and 30% fine to medium to sand (Taylor 2010). Small deposits of peat associated with bulkhead construction near the turning notch are also possible. Beach placement of dredged material would require processing of the dredged material to screen out any materials greater than 1-inch and removing all silts, clays and peat deposits. The USACE has determined that processing is not viable due to space limitations at Port Everglades and additionally, there is limited capacity for beach material within the Shore Protection Project. Other beneficial uses of dredged material including construction fill, cap material in aquatic remediation projects, wetland creation, wetland restoration, landfill cover and recycling into commercial products will be evaluated as part the Port Everglades Harbor expansion project DEIS (USACE, 2011).

The existing ODMDS was designated to accommodate dredged material from periodic maintenance events in the Port. It received final designation by USEPA in February 2005 (70 FR 2808) following the completion of a July 2004 EIS for the ODMDS designation. However, recent capacity modeling (Figure 2) indicates the existing, approved ODMDS is insufficient in size to contain the proposed 6.63 mcy of dredged material associated with the proposed Port Everglades expansion project discussed above (Taylor 2010). Therefore, there is a need to expand the existing ODMDS to accommodate the dredged material resulting from the planned Port Everglades Harbor expansion project. The need for ocean disposal is based primarily on the lack of economically, logistically, and environmentally feasible alternatives for the disposal of the projected quantities of dredged material deemed unsuitable for beach re-nourishment or beach placement (USACE, in press). Should the scope of the Port Everglades Harbor expansion decrease or should alternatives to ocean disposal be identified, EPA will re-evaluate the need for this action.




| Approximate Height Above Existing Grade | | | |
|---|---|---|---|
| RANGE | MIN HEIGHT (CM) | MAX HEIGHT (CM) | COLOR |
| 1 | 1.0 | 5.0 | |
| 2 | 5.0 | 10 | |
| 3 | 10 | 30 | |
| 4 | 30 | 300 | |
| 5 | 300 | 600 | |
| 6 | 600 | 900 | |
| 7 | 900 | 950 | |

**Figure 2. MDFATE and STFATE capacity modeling conducted by Taylor Engineering (Taylor 2010) shows simulated dredged material exceeding the boundaries of the Port Everglades ODMDS.**

A secondary need for expansion is for Operations and Maintenance (O&M) material and/or other non-federal projects. The USACE has estimated that over the next fifty years, there will be a need for ocean disposal of approximately 1.5 million cubic yards of maintenance material from the federal project (USACE, 2011; USACE 2005). The original site designation was based on individual maintenance projects of up to 500,000 cy material. In 2005, approximately 60,000 cy of dredged material was placed in the existing ODMDS via a release zone in the middle of the site.  A 2006 post-disposal monitoring survey showed dredged material was observed to have exceeded the existing site's northern boundary, forming an uneven ellipse elongated in a north-south direction (Germano & Associates, Inc. 2006).  Figure 3 shows the extent and thickness of dredged material within and exceeding the Port Everglades ODMDS to the north of the site. Based on the results of this survey, the disposal release zone was moved to the southern end of the site to account for the strong northern Florida Current/Gulf Stream's effect on the dispersion of the disposed material. USACE conducted an O&M dredging event in early 2013 of approximately five times more dredged material than in 2005. EPA is planning a post disposal monitoring event in 2014. The monitoring will determine if movement of the disposal release zone was sufficient to contain all material within the existing boundaries or if a site expansion is needed to accommodate O&M material. Broward County has also proposed using the ODMDS for disposal material from the Port Everglades Sand Bypass Project (SAJ-2008-2034). Project volumes could exceed 500,000 cubic yards (Creed, 2013) requiring capacity modeling and possible site expansion. If the revised disposal release zone is not sufficient to contain the dredged material within the ODMDS boundaries or if future projects are expected to exceed the capacity of the ODMDS, a need will exist to expand the site.

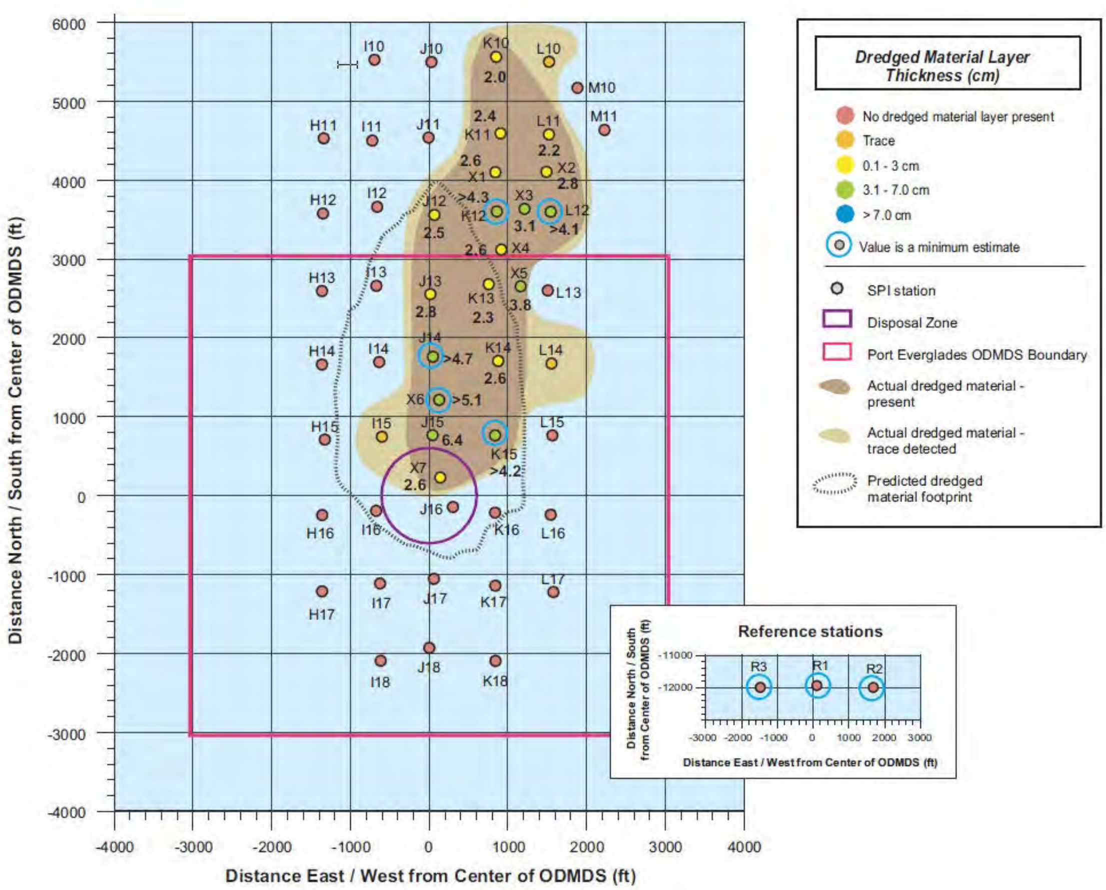



**Figure 3. Distribution of dredged material after maintenance disposal event, based on analysis of sediment profile images as compared with modeled results for the Port Everglades ODMDS (Germano & Associates, Inc. 2006).**

## 1.4 AGENCY GOAL OR OBJECTIVE

The USACE, Jacksonville District has identified the need (goal) to expand the Port Everglades Harbor ODMDS to a size sufficient to accommodate the proposed dredged material from Port expansion plus routine maintenance activities.

Pursuant to Section 102 of MPRSA, in a letter dated March 30, 2011, USACE has requested that the USEPA expand the Port Everglades Harbor ODMDS. In accordance with the April 30, 2007 Memorandum of Understanding (MOU) between USACE and USEAP, and to attain this goal, USACE is coordinating with USEPA Region 4 to prepare this EA to address the alternatives, affected environment, and environmental effects of the proposed expansion (objective).

## 1.5 RELATED ENVIRONMENTAL DOCUMENTS

The following documents are relevant to the proposed ODMDS expansion:

*Final Environmental Impact Statement (FEIS) for Designation of the Palm Beach Harbor Ocean Dredged Material Disposal Site and the Port Everglades Harbor Ocean Dredged Material Disposal Site*. USEPA, July 2004

*Port Everglades Harbor Ocean Dredged Material Disposal Site - Site Management and Monitoring Plan,* USEPA/USACE, November 2004

*Revisions to the Port Everglades Harbor Ocean Dredged Material Disposal Site (ODMDS) Site Management and Monitoring Plan,* USEPA/USACE, May 2009

*Sediment and Water Quality of Candidate Ocean Dredged Material Disposal Sites for Port Everglades and Palm Beach, Florida,* USEPA, prepared for USACE, June 1999

*Rapid Seafloor Reconnaissance and Assessment of Southeast Florida Ocean Dredged Material Disposal Sites Utilizing Sediment Profile Imaging - Post-Disposal SPI Mapping at the Port Everglades Harbor ODMDS,* Germano & Associates, Inc., prepared for USEPA, May 2006

*Evaluation of Dredged Material Behavior at the Port Everglades Harbor Federal Project Ocean Dredged Material Disposal Site;* by Taylor Engineering, Inc. for ANAMAR Environmental, Inc., prepared for USACE, June 2010 (Updated November 2010)

Port *Everglades ODMDS Survey, Port Everglades, Florida*, by ANAMAR Environmental Consulting, Inc., prepared for USACE, November 2010.

*Site Designation Study for the Port Everglades Harbor Ocean Dredged Material Disposal Site Expansion: May 2011 Survey Results.* ANAMAR Environmental Consulting, Inc., prepared for USACE, January 2012

## 1.6 DECISIONS TO BE MADE

This EA will evaluate whether to expand the current authorized Port Everglades ODMDS to a size that will allow for the dredged material disposal needs projected for the proposed Port Everglades expansion and maintenance dredging events and the alternatives considered to accomplish that goal. ODMDS expansion is contingent on the Port expansion project moving forward, future monitoring results showing a need for site expansion associated with O&M dredging, or other documented need for a larger ODMDS.

## 1.7 SCOPING AND ISSUES

### 1.7.1 Issues Evaluated in Detail

The following issues were identified to be relevant to the proposed action and appropriate for detailed evaluation:

- Vegetation;
- Threatened and Endangered Species;
- Hardbottom Habitats
- Fish and Wildlife Resources;
- Essential Fish Habitat;
- Coastal Barrier Resources;
- Water Quality;
- Hazardous, Toxic, and Radioactive Wastes;
- Air Quality;
- Noise;
- Recreation Resources;
- Navigation and Public Safety;
- Historic and Cultural Resources; and
- Military Usage.

### 1.7.2 Impact Measurement

The following provides the means and rationale for measurement and comparison of impacts of the proposed alternatives.

In the deep-water marine environment of the existing and proposed alternative ODMDSs, there is a finite amount of information available on which to design the expanded ODMDS and measure and compare the impacts of the proposed alternatives. For the proposed ODMDS expansion, this study utilized sidescan sonar surveys; biological, sediment, and water quality surveys; limited still photography; and modeling tools such as Short-Term Fate (STFATE) and Multi-Dump Fate (MDFATE) to evaluate the impacts of the proposed alternatives (described in Section 2).

USACE reviewed the available sidescan sonar data along with plan view and Sediment Profile Imaging (SPI) photography to identify the most appropriate area in which to expand the existing ODMDS. Sidescan sonar data provides scientists with an understanding of existing bottom features and is useful in identifying potential hardbottom communities and other features such as potential shipwrecks. It is a key factor in locating suitable ODMDS sites in deep-water environments.

Simulations of dredged material disposal at the Port Everglades ODMDS were conducted using the Automated Dredging and Disposal Alternatives Modeling System (ADDAMS). STFATE and MDFATE modeling studies were used to determine the need for expansion and the required size of the expanded ODMDS. Several simulations were performed on multiple disposal release zone configurations within the existing ODMDS. The results found that the area of the deposition contour exceeding the existing ODMDS boundary for all model simulations was excessive, thus indicating a need to expand the ODMDS (Figure 2). Expansion alternative configurations were determined based on containing dredged material of a 1 cm thickness or greater.

Alternative ODMDS configurations were identified using sidescan sonar data to identify possible locations for the ODMDS expansion and modeling to determine the size of the expansion sites. Biological, water quality and sediment data from the May 2011 OSV Bold site designation study and cultural resource surveys conducted in November 2011 and July 2012 were then used to confirm the suitability of the proposed alternative sites and, where possible, measure and compare impacts of the proposed alternatives.

### 1.7.3 Issues Eliminated from Detail Analysis

The following issues were not considered important or relevant to the proposed action, as they are not located in the action area: Aesthetic Resources and Solid Waste.

## 1.8 PERMITS, LICENSES, AND ENTITLEMENTS

Refer also to Sections 1.1.4, Permits, Licenses and Entitlements and 4.35, Compliance with Environmental Requirements of the 2004 Final EIS for site designation.

USEPA Region 4 and the USACE Jacksonville District share responsibility for control and management of the Port Everglades Harbor ODMDS under the MPRSA. The MPRSA assigns basic responsibility to USEPA and USACE for ensuring that ocean dredged material disposal activities will not unreasonably degrade or endanger human health, welfare, amenities, or the marine environment (MPRSA Sections 102 and 103). Section 102 of the MPRSA authorizes USEPA to designate sites or times at which dumping may occur and to establish criteria for reviewing and evaluating permit applications. It also requires USEPA, in conjunction with

USACE, to develop site specific SMMPs for each ODMDS. Section 103 of the MPRSA authorizes USACE to issue permits for the transportation of dredged material, subject to compliance with the USEPA environmental criteria (Ocean Dumping Criteria at 40 CFR Part 227) and USEPA concurrence with USACE's finding of compliance. Section 103(b) authorizes USACE, with USEPA concurrence, to select alternative project sites of limited duration for disposal of dredged material in ocean waters when the use of a site designated by USEPA is not feasible.

During preparation of this EA, a process of coordination and concurrence will be conducted through the distribution of the EA for this proposed action to Federal and Florida state agencies, offices, and organizations having authority over issues associated with this action. Appendix A of the Final Environmental Assessment will include letters of concurrence, recommendations, or approvals from the following entities:

- National Marine Fisheries Service– Consultation pursuant to Section 7 of the Endangered Species Act for species under their jurisdiction.

- National Marine Fisheries Service – Essential Fish Habitat Consultation and Conservation Recommendations pursuant to section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act.

- Florida Department of Environmental Protection - Coastal Zone Consistency (CZC) Concurrence that the proposed federal project is consistent with Florida's Coastal Zone Management Act.

# 2 ALTERNATIVES

The alternatives section is the heart of this EA. This section describes the no-action alternative and the alternatives that were studied in detail. Based on the information and analysis presented in the sections on the Affected Environment and the Environmental Effects, this section presents the beneficial and adverse environmental effects of all alternatives in comparative form, providing a clear basis for choice among the options for the decision-maker and the public.

## 2.1 DESCRIPTION OF ALTERNATIVES

The existing ODMDS was designed to accommodate material from O&M dredging events and small new work projects for project with less than 500,000 cy of dredged material per project. The Port Everglades ODMDS SMMP requires capacity modeling for amounts over 500,000 cy of material.

Considering the Port Everglades expansion is expected to generate more than 500,000 cy of dredged material, studies were initiated to determine the size and location of an ODMDS that could accommodate the volume of dredge material anticipated to be generated by Port expansion.

STFATE and MDFATE were performed using 6.63 million cubic yards of dredge material to determine the needed size of the expanded ODMDS. The results confirmed that dredged material deposition exceeded the existing ODMDS footprint. The modeling studies identified an initially proposed expansion area; however, the southern portion of the potential expansion area encroached into a Navy Use Area that had specifically been avoided during the original site designation at the request of the Navy (see Section 2.4). Existing sidescan sonar survey data of areas adjacent to the existing ODMDS and outside of the Navy Use Area were reviewed to identify other possible expansion sites.

Modeling of the expanded ODMDS was done using both an east-west and a north-south disposal release configurations (Figure 4). Resulting expansion areas were designed to contain all sediment deposition of a thickness greater than 1 cm and to be located within the area of existing sidescan sonar data.

The results generated two potential expansion areas: a 3.21 sq. nmi site with a north-south oriented release zone; and a 2.89 sq nmi site with an east-west oriented release zone (Figure 5, Figure 6). The western edge of both alternative sites is approximately 3.25 nmi offshore.

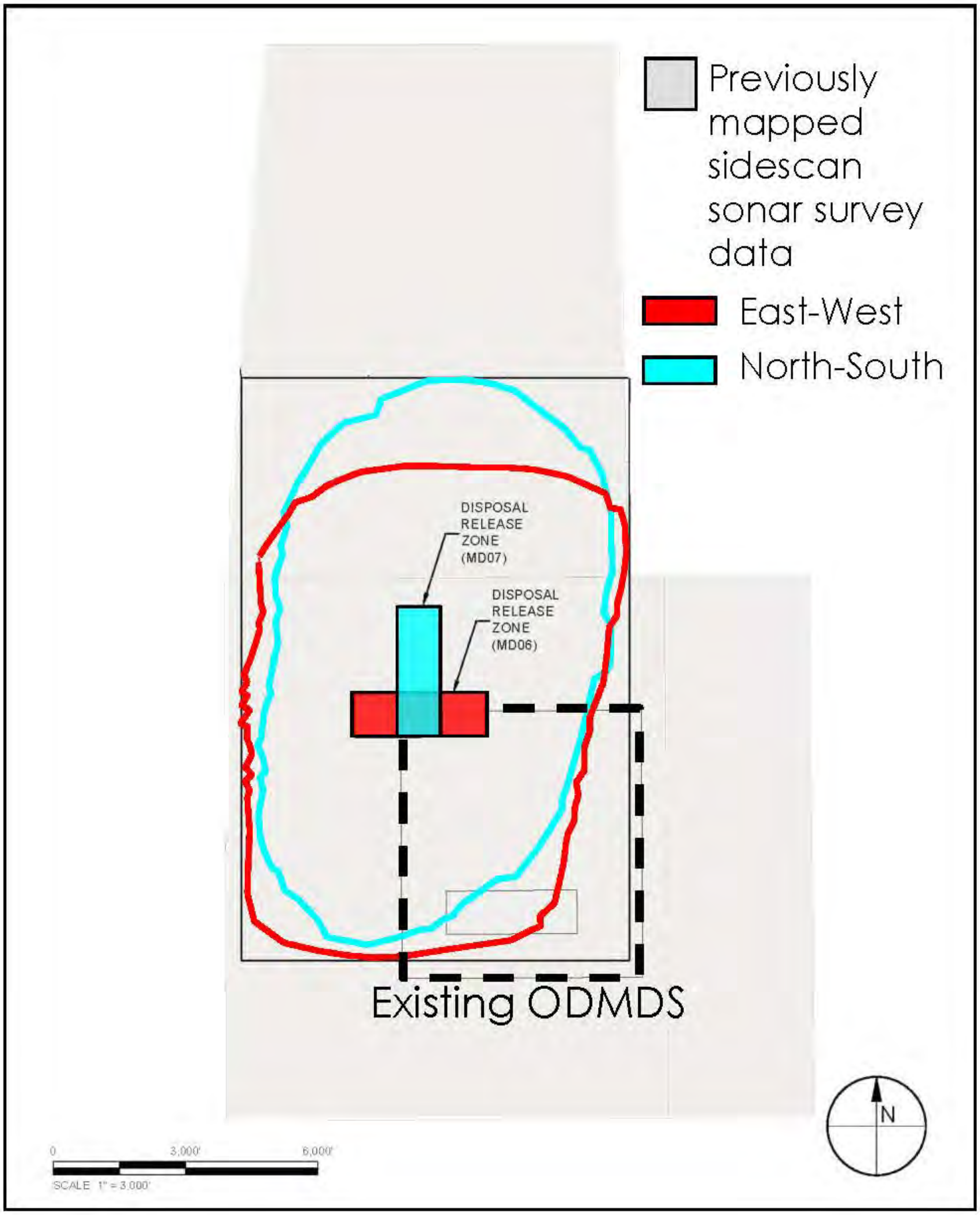



**Figure 4. Results of modeling, using both an east-west and a north-south disposal release configurations denoted in the center of the site in red and blue, respectively. Resulting expansion areas were designed to contain all sediment deposition of a thickness greater than 1 cm, denoted by red and blue contours, and to be located within the area of existing sidescan sonar data.**

To be considered as a potential ODMDS, alternatives are considered under the five general (40 CFR Part 228.5) and 11 specific (40 CFR Part 228.6) criteria of the MPRSA. The general criteria are:

(1) 40 CFR 228.5(a). The dumping of materials into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation.

(2) 40 CFR 228.5(b). Locations and boundaries of disposal sites will be so chosen that temporary perturbations in water quality or other environmental conditions during initial mixing caused by disposal operations anywhere within the site can be expected to be reduced to normal ambient seawater levels or to undetectable contaminant concentrations or effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shellfishery.

(3) 40 CFR 228.5(c). If at any time during or after disposal site evaluations studies, it is determined that existing disposal sites presently approved on an interim basis for ocean dumping do not meet the criteria for site selection set forth in Sections 228.5 through 228.6, the use of such sites will be terminated as soon as suitable alternate disposal sites can be designated.

(4) 40 CFR 228.5(d). The sizes of ocean disposal sites will be limited in order to localize for identification and control any immediate adverse impacts and permit the implementation of effective monitoring and surveillance programs to prevent adverse long-range impacts. The size, configuration, and location of any disposal site will be determined as a part of the disposal site evaluation or designation study.

(5) 40 CFR 228.5(e). USEPA will, wherever feasible, designate ocean dumping sites beyond the edge of the continental shelf and other such sites that have been historically used.

The 11 specific criteria are:

(1) Geographical position, depth of water, bottom topography and distance from coast;

(2) Location in relation to breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases;

(3) Location in relation to beaches and other amenity areas;

(4) Types and quantities of wastes proposed to be disposed of, and proposed methods of release, including methods of packing the waste, if any;

(5) Feasibility of surveillance and monitoring;

(6) Dispersal, horizontal transport and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any;

(7) Existence and effects of current and previous discharges and dumping in the area (including cumulative effects);

(8) Interference with shipping, fishing, recreation, mineral extraction, desalination, fish and shellfish culture, areas of special scientific importance and other legitimate uses of the ocean;

(9) The existing water quality and ecology of the site as determined by available data or by trend assessment or baseline surveys;

(10) Potentiality for the development or recruitment of nuisance species in the disposal site;

(11) Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.

The general and specific criteria were considered in the 2004 EIS for the ODMDS designation, Sections 4.3.3 and 4.3.4 respectively, for the designation of the existing ODMDS (USEPA 2004) and are incorporated by reference. Consideration of the criteria for the expansion Alternatives 1 and 2 are not expected to significantly deviate from the findings for the designation of the existing site. Section 2.6 examines a comparison of the proposed alternatives and compliance with the general criteria and specific criteria in Table 2 and Table 3.

### 2.1.1 Alternative Site 1: North-South Disposal Zone - Preferred Alternative

Alternative 1, a 3.21 sq. nmi. (2,721 acres) site has a north-south oriented release zone and is the environmentally and operationally preferred alternative (Figure 5). The western edge of the site is located approximately 3.3 nmi (6.1 km) offshore and the center of the site is located approximately 4.0 nmi (7.4 km) offshore. Water depths range from 604 to 735 feet (184 to 224 meters). Previously collected sidescan sonar data (EPA 2004) and data collected from the OSV Bold site designation survey in May 2011 (ANAMAR 2012), indicate the bottom within the Alternative 1 expansion area is primarily a homogenous mix of sand and silt and clay with scattered rubble.

Alternative 1 is the environmentally preferred alternative that minimizes the areal coverage of potential hardbottom areas. Although Alternative 1 covers 0.32 $nmi^2$ (11%) more area than Alternative 2, it is estimated to impact less potential hardbottom. Based on photographic and side scan sonar data for estimated hardbottom as presented in Section 3.4, Alternative 1 will have less impact on potential hardbottom within the project area.

Alternative 1 is also the preferred alternative based on operational considerations. The strong northerly current of the Florida Current/Gulf Stream averages 1.3 m/s (2.5 knots), however varies considerably with reported current velocities  from one to four knots (Taylor 2010; USEPA 2004). USACE Operation Division has stated the north-south configuration of the disposal release zone in Alternative 1 will provide additional control and safety when unloading material. An elongated north-south disposal release zone configuration will permit a disposal vessel to orient parallel to the strong current allowing added control of the vessel.

This same strong Florida Current/Gulf Stream current is experienced at the Miami ODMDS approximately 22 nmi south of the Alternatives. An analysis of dredged material disposal vessel tracks during the Miami Harbor Phase II construction dredging showed some vessels experienced an increased transit time from the Miami Harbor to the Miami ODMDS. This increased transit time was due to decreased vessel control and maneuverability at the Miami ODMDS disposal release zone. Data showed that out of 785 total transits, 12.6% inadvertently passed the disposal release zone and had to attempt several approaches before maneuvering to the release zone, thus causing an increased transit time. These vessels had an average of 25% increased transit time. It was noted that early in the project, when vessels approached the ODMDS from the west/north-west, more re-approaches were required than later in the project when vessels approached directly from the north, parallel to the current (USACE 2012).

### 2.1.2 Alternative Site 2: East-West Release Zone

Alternative Site 2, a 2.89 sq. nmi. (2,449 acre) site has an east-west oriented release zone (Figure 6). The western edge of the site is located approximately 3.2 nmi (5.9 km) offshore and the center of the site is located approximately 3.9 nmi (7.2 km) offshore. Water depths range from 604 to 735 feet (184 to 224 meters). Previously collected sidescan sonar data (EPA 2004) and data collected from the OSV Bold site designation study in May 2011 (ANAMAR 2012), indicate the bottom within the Alternative Site 2 expansion area is primarily a homogenous mix of sand and silt and clay with scattered rubble.

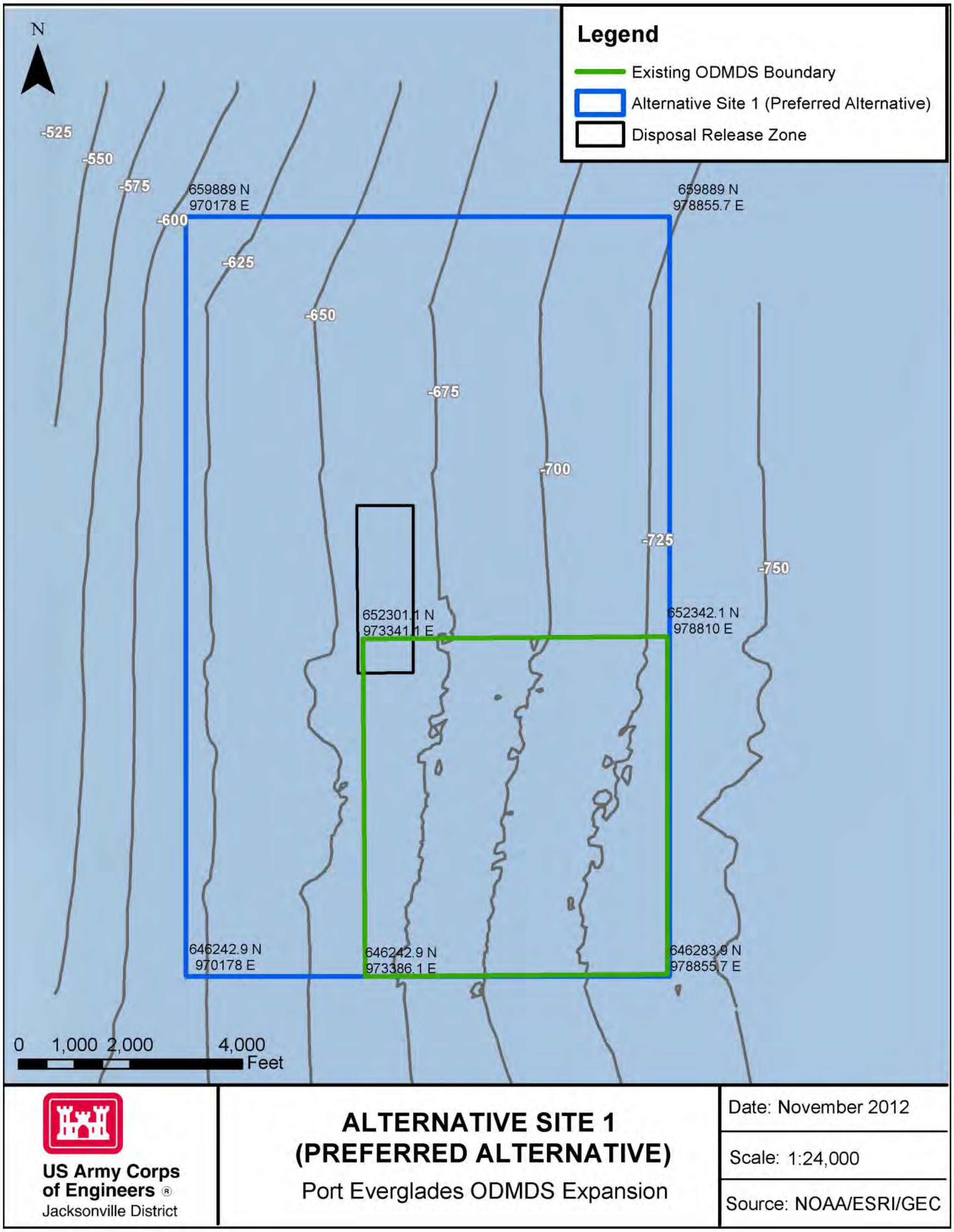



**Figure 5. Alternative Site 1 including potential disposal release zone developed based on modeling conducted in 2010.**

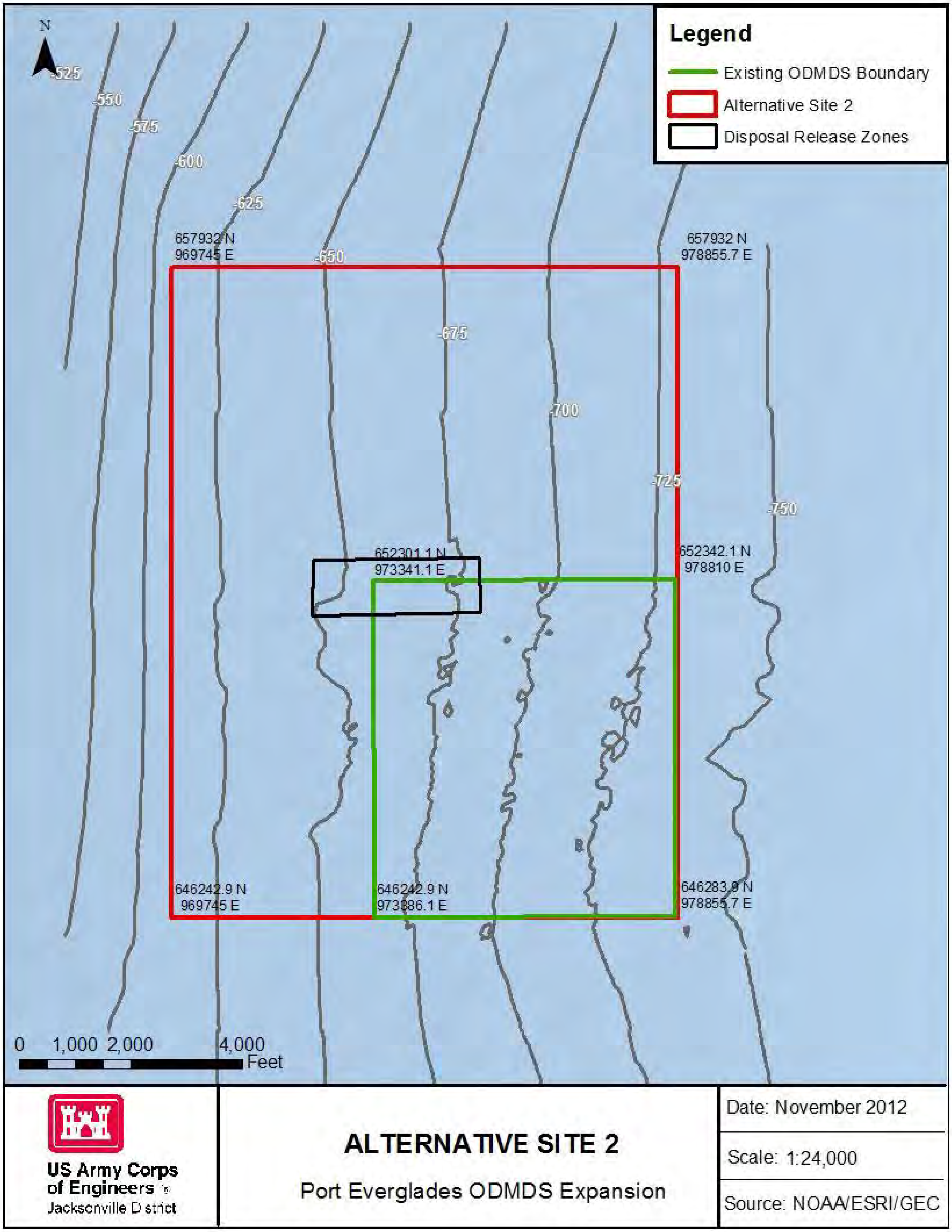



**Figure 6. Alternative Site 2 including potential disposal release zone developed based on modeling conducted in 2010.**

### 2.1.3 No Action Alternative (Status Quo)

The No-Action Alternative is defined as not designating an expanded ODMDS pursuant to Section 102 of the MPRSA. The existing site is limited to 500,000 cy of dredged material per dredging event without project specific capacity modeling studies. The existing ODMDS is not adequate for the proposed Port Everglades expansion activities. Secondarily, is it unclear if the site is an adequate size to accommodate routine maintenance material due to the strong northerly Florida Current/Gulf Stream current and further volume constraints may be required adversely affecting routine harbor maintenance activities. Thus, the No-Action Alternative would not provide an expanded, acceptable USEPA-designated disposal site for use by the USACE or other entities for the disposal of large quantities of dredged material. Without an expanded disposal site, the expansion of the Federal Navigation Project at Port Everglades Harbor would be adversely impacted with subsequent effects upon the national, regional and local economies (USACE, in press). Should the No-Action Alternative be chosen for this project, although the existing ODMDS was authorized for the disposal of dredged material up to 500,000 cy each dredging event; based on the 2006 monitoring results, the existing ODMDS may not be able to contain O&M material volumes of less than 500,000 cy. Per Table 3 of the 2004 SMMP ((EPA/USACE, 2004) for the Port Everglades ODMDS, if material continues to fall outside of the boundaries of the existing site, even after realignment of the disposal zone (as previously discussed) EPA may limit the amount of dredged material that could be placed in the existing site during each dredging event. This would result in limitations on how much dredged material could be removed from the Port's channels and berths per dredging event, which would impact operations by restricting vessel drafts that could access those areas that were unable to be dredged due to the volume limitation. In light of this development that would restrict the federal and local maintenance of federal navigation channels, the USACE may select an alternative site under Section 103(b) of MPRSA.

## 2.2 ISSUES AND BASIS FOR CHOICE

The alternatives were evaluated based on their ability to provide the required capacity for disposing dredged materials both for the proposed harbor expansion and for ongoing and future O&M dredging operations, and their location in relation to other resources.

## 2.3 PREFERRED ALTERNATIVE

Based on the analysis provided in this EA and the evaluation of the alternatives with respect to the potential issues identified, Alternative 1 is recommended as the Preferred Alternative based on environmental preference and operational constraints of tug towing a scow under the current regime found in the site. Alternative 1 with the North-South disposal zone is found to affect less potential hardbottom in the project areas and also provides the most operationally favorable alternative by allowing disposal vessels to orient parallel to the strong northerly local current.  This allows the vessel pilots the safest and most accurate approach to dispose of dredged material.

## 2.4 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION

The initially proposed expansion area (Figure 7) was eliminated from detailed evaluation at the request of the U.S. Navy.  The U.S. Navy has authority over the authorization of activities occurring in this area as a result of Federal Regulations (see NOS 2010 for limits and regulations).  These regulations state, "(1) Anchoring, trawling, dredging, or attaching any object to the submerged sea bottom shall be prohibited in the above described area."  The initial modeling results indicated that using the existing release zone with the increased volumes would create an expanded ODMDS site that encroached upon the Navy Use Area (see Figure 7).  Additionally, during the original site designation, in a letter dated June 30, 1995, the Navy requested that EPA exclude the Navy Use Area to avoid impacting operations conducted by the Navy in the site. During the alternative review for the proposed expansion, USACE and EPA re-verified with the Navy that the Navy Use Area should be avoided, and the Navy concurred with that determination (USN, 2010). Therefore, this alternative was eliminated from detailed evaluation and options for expanding the ODMDS to the north were explored.

Alternatives to ocean disposal were considered, as required by Section 102 of the MPRSA and NEPA. Based on the current conditions and in consideration of the analyses conducted and discussed in the 2004 EIS for the ODMDS designation, the following alternatives were eliminated from detailed analysis in this EA:

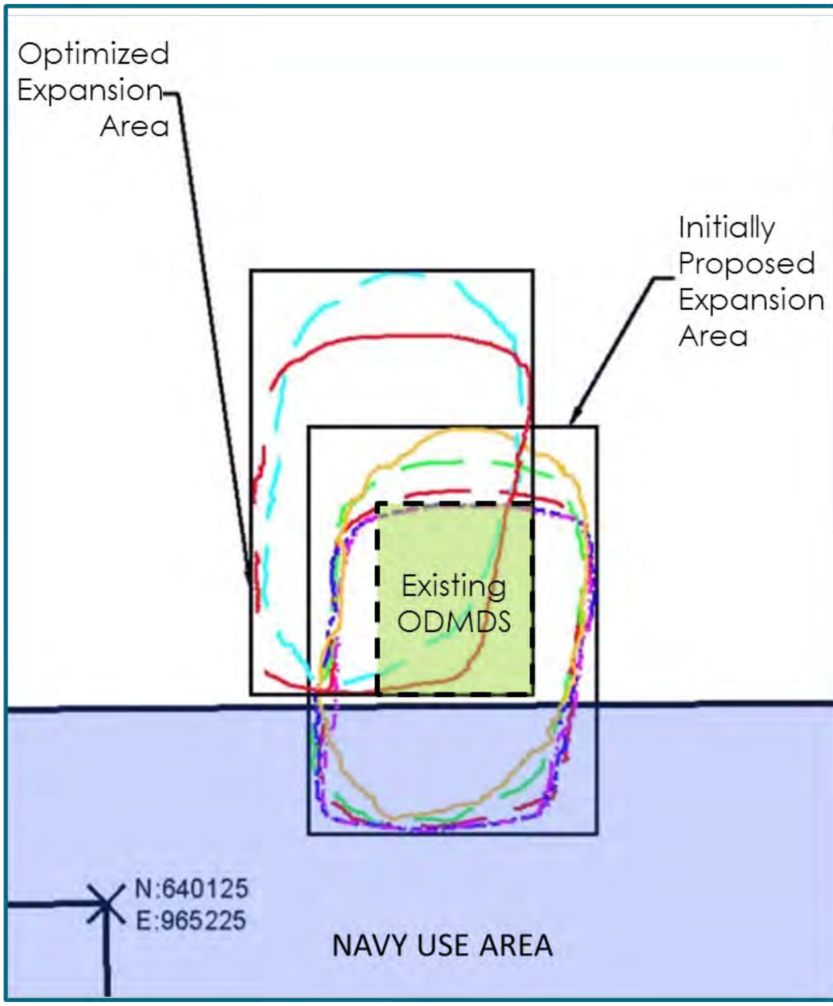



**Figure 7. Graphic showing the location of the initially proposed expansion area that extends into the Navy Use Area. The optimized expansion area was shifted to the north and west to avoid the Navy Use Area. The figure shows the outlines encompassing resulting deposition areas from modeling. The optimized expansion area show resulting deposition areas from a north-south oriented disposal zone (blue) and an east-west oriented disposal zone (red). Alternative Site 1 fully encompasses the blue deposition area, while Alternative Site 2 fully encompasses the red deposition area.**

<u>Upland Disposal:</u> Two potential sites, land belonging to Port Everglades and land belonging to the Ft. Lauderdale/Hollywood International Airport (FLL), were examined as potential upland dredged material disposal sites. Due to development within the Port and further evaluation of the FLL's runway expansion plans, both the Port and FLL have withdrawn the use of their upland properties as upland placement options.

Further, the potential upland disposal sites were considered environmentally valuable in their own right, and neither was more cost-effective than ocean disposal. There are currently no other known upland sites suitable for the placement of dredged materials in the project vicinity. As a result, upland disposal is not a viable option for the placement of dredged materials from the Port Everglades Harbor Federal Navigation Project (USACE, in press).

Beach Placement: The issue of potentially reducing the opportunity for beneficial use of the dredged material, such as beach nourishment and placement, due to the availability of ocean disposal was addressed during the designation of the original ODMDS (USEPA 2004). The Federal Standard is defined as the least costly dredged material disposal or placement alternative identified by USACE that is consistent with sound engineering practices and meets all Federal environmental requirements. Establishing the Federal Standard is not the same as selecting a disposal alternative, but rather establishes a base plan which defines the disposal or placement cost assigned to the navigation purpose of the project.

Beach placement is typically the least-cost disposal option when the dredged material meets the standards set by the Florida Department of Environmental Protection (FDEP) for beach or nearshore placement. The State of Florida's Beach Management Rule, Chapter 62B-41.007, Subsections 5(j)-5(k) defines beach quality material as material that maintains the general character and functionality of material occurring on a beach and in adjacent dunes and coastal systems. Such material is predominantly carbonate, quartz, or other similar material with a particle size distribution ranging from 0.062 millimeters (mm) and 4.76 mm, must be similar in color and grain size distribution to existing material at the placement site, and must not contain any of the following:

- Greater than 5 percent (%), by weight, silt, clay, or colloids passing the #230 sieve;
- Greater than 5%, by weight, fine gravel retained on the #4 sieve;
- Coarse gravel, cobbles, or material retained on the ¾-inch sieve in a percentage or size greater than that of material on the native beach;
- Construction debris, toxic material, or other foreign matter; and
- Any materials or characteristics that would result in cementation on the beach.

Sandy sediment derived from the maintenance of coastal navigation channels is deemed suitable for beach placement with up to 10 percent fine material passing the #230 sieve, provided that it meets the above criteria and appropriate water quality standards. Such material containing 10-20 percent fine material passing the #230 sieve and meeting all other sediment and water quality standards is considered suitable for placement on nearshore portions of beaches.

When beach or nearshore placement is the least-cost disposal option, the Federal Government is responsible for 100 percent of the disposal costs associated with placement. However, if some of the material does not meet the standards for beach placement or for other reasons beneficial use is not the base plan, the USACE has various legislative authorities to share the incremental costs of the beneficial use or beach placement above the base plan. USEPA and USACE strongly support beneficial use projects. However, in some cases, beneficial uses will not be available and ocean disposal will be needed. The success of beneficial use projects depends on the creation of partnerships between Federal and non-Federal interests and requires local leadership and local financial commitments to succeed.

The majority of excavated materials from the planned Port Everglades Harbor expansion project will be silt, sand, gravel, cobble, and boulder-sized components. To extract beach compatible sand would require significant expense, plus a site where extraction of beach compatible sand could be conducted. Considering that a majority of the dredged material found in the Port Everglades Navigation Project Harbor may not always meet the standards for beach or nearshore placement, alternative disposal options to beach re-nourishment or placement are needed. USACE evaluated beach placement in an April 2005 EA. Historically, shoal material from the entrance channel has consistently met the standards and is expected to be placed on John U. Lloyd State Park (USACE 2005).

## 2.5 ALTERNATIVES NOT WITHIN JURISDICTION OF LEAD AGENCY

Upland and beach placement are not within the jurisdiction of EPA. They are within the jurisdiction of the USACE, a cooperating agency. EPA has the authority to review beach placement activities pursuant to Section 404 of the Clean Water Act. Upland and beach placement alternatives were discussed in the 2004 Final Environmental Impact (EPA, 2004).

## 2.6 COMPARISON OF ALTERNATIVES

Table 2 provides a comparison of the proposed alternatives and compliance with the five general criteria for designation outlined in 40 CFR 228.5. Table 3 provides a comparison of the proposed alternatives and compliance with the eleven specific criteria for designation outlined in 40 CFR 228.6. Table 4 summarizes the major features and consequences of the alternatives that were considered. The primary difference between the two alternatives (other than the No Action Alternative) is that Alternative Site 1 allows for less potential hardbottom impacts and as well maximum operational efficiency and vessel safety. Section 4, Environmental Effects provides a more detailed discussion of the impacts of the alternatives considered.

**Table 2. A comparison of the proposed alternatives and compliance with the general criteria for designation outlined in 40 CFR 228.5.**

| GENERAL CRITERIA | Compliance |
|---|---|
| 40 CFR 228.5(a) The dumping of materials into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation. | The existing ODMDS does not support any exclusive commercial or recreational fishery, recreational boating, or specially designated shipping lanes (USEPA 2004). Alternative Sites 1 and 2 encompass and are adjacent to the existing ODMDS and are similarly expected not to impact these activities. |
| 40 CFR 228.5(b) Locations and boundaries of disposal sites will be so chosen that temporary perturbations in water quality or other environmental conditions during initial mixing caused by disposal operations anywhere within the site can be expected to be reduced to normal ambient seawater levels or to undetectable contaminant concentrations or effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shellfishery. | The western edge of both alternative sites is approximately 3.25 nmi east of the nearest shoreline such that the prevailing current will not transport dredged material to beaches. Temporary changes caused by the physical movement of sediment through the water column will be reduced to ambient conditions before reaching any environmentally sensitive area. The western edge of both alternatives are approximately 0.6 nmi west of the western edge of the existing ODMDS and are similarly expected not to impact any environmentally sensitive area. |
| 40 CFR 228.5(c) If at any time during or after disposal site evaluations studies, it is determined that existing disposal sites presently approved on an interim basis for ocean dumping do not meet the criteria for site selection set forth in Sections 228.5 through 228.6, the use of such sites will be terminated as soon as suitable alternate disposal sites can be designated. | Not applicable. There are no sites currently approved on an interim basis for ocean dumping near this project. |
| 40 CFR 228.5(d) The sizes of ocean disposal sites will be limited in order to localize for identification, to control any immediate adverse impacts, and to permit the implementation of effective monitoring and surveillance programs to prevent adverse long-range impacts. The size, configuration, and location of any disposal site will be determined as a | The size and configuration of Alternative Sites 1 and 2 were designed using modeling studies that determined an area to contain all proposed dredged material deposition of a thickness of one centimeter or greater. This criterion was chosen to avoid dredged materials from being deposited outside of the designated |

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|---|---|
| part of the disposal site evaluation or designation study. | boundaries of the disposal site. Both alternatives will allow for the implementation of effective monitoring and surveillance programs to prevent adverse long-range impacts. |
| 40 CFR 228.5(e) USEPA will, wherever feasible, designate ocean dumping sites beyond the edge of the continental shelf and other such sites that have been historically used. | The continental shelf in the vicinity of the proposed sites has a width of approximately 0.63 nmi (USEPA 2004). Alternative Sites 1 and 2 lay approximately 2.7 nmi beyond the edge of the shelf. The locations of the Alternative Sites were chosen to encompass the existing ODMDS which has been used previously. |

**Table 3. Comparison of the proposed alternatives and compliance with the specific criteria for designation outlined in 40 CFR 228.6**

| SPECIFIC CRITERIA | Alternative Site 1 | Alternative Site 2 | No Action Alternative |
|---|---|---|---|
| (1) Geographical position, depth of water, bottom topography and distance from coast; | The western edge of the site is approximately 3.3 nmi east of the nearest shoreline. The center of the site is approximately 4 nmi east of the nearest shoreline. Water depths within the site range from approximately 604 to 735 feet. Sediment within the site is predominantly sand (55.7–64.9% Sand) (ANAMAR 2012). | The western edge of the site is approximately 3.2 nmi east of the nearest shoreline. The center of the site is approximately 3.9 nmi east of the nearest shoreline. Water depths within the site range from approximately 604 to 735 feet. Sediment within the site is predominantly sand (55.7–64.9% Sand) (ANAMAR 2012). | The western edge of the site is approximately 3.8 nmi east of the nearest shoreline. The center of the site is approximately 4.3 nmi east of the nearest shoreline. Water depths within the site range from 640 to 735 feet. Sediment within the site is predominantly sand (64.3% Sand) (ANAMAR 2012). |
| (2) Location in relation to breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases; | Same as No Action Alternative | Same as No Action Alternative | The existing ODMDS is not located in exclusive breeding, spawning, nursery, feeding, or passage areas for adult or juvenile phases of living resources. |
| (3) Location in relation to beaches and other amenity areas such as natural and artificial reefs | The center of Alternative Site 1 is located approximately 4.0 nmi from the nearest coastal beach. The site is approximately 0.68 nmi east of the nearest artificial reef (the Qualmann Barge). The natural reef tract lay 1.8 nmi inshore of the site. No significant impacts | The center of Alternative Site 2 is located approximately 3.9 nmi from the nearest coastal beach. The site is approximately 0.58 nmi east of nearest artificial reef (the Qualmann Barge). The natural reef tract lay 1.7 nmi inshore of the site. No significant | The center of the Existing ODMDS is located approximately 4.3 nmi from the nearest coastal beach. The site is approximately 1.68 nmi east of the nearest artificial reef (the Qualmann Barge). No significant impacts expected to resources or amenity areas associated with the existing ODMDS. The existing ODMDS was found to not |

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|---|---|---|---|
| | are expected to resources or amenity areas associated with Alternative 1. The project area does not support any significant recreational and commercial fisheries resource | impacts are expected to resources or amenity areas associated with Alternative 2. The project area does not support any significant recreational and commercial fisheries resource | support any significant recreational and commercial fisheries resource (USEPA 2004). |
| (4) Types and quantities of wastes proposed to be disposed of, and proposed methods of release, including methods of packing the waste, if any; | Only material that meets EPA Ocean Dumping Criteria 40 CFR 220-229 will be placed in the proposed site. Maintenance volumes are estimated to average approximately 30,000 cubic yards per year however yearly dredging is uncommon. Maintenance material typically consists of varying percentages of sand and silt. Additional volumes include up to an estimated 6.63 mcy of new work material. New work material will consist of silt, sand, gravel, cobble and potentially bolder size components. | Same as Alternative 1. | Only material that meets EPA Ocean Dumping Criteria 40 CFR 220-229 will be placed in the proposed site. Maintenance volumes are estimated at approximately 30,000 cubic yards per year however yearly dredging is uncommon. Maintenance material typically consists of varying percentages of sand and silt. With the no action alternative, the existing ODMDS would continue to be available for maintenance and disposal of dredged material from projects not exceeding more than 500,000 cy per dredging event |
| (5) Feasibility of surveillance and monitoring; | Same as No Action Alternative | Same as No Action Alternative | USEPA expects monitoring and surveillance at the existing ODMDS to be feasible. Due to the depths (>700 feet) and location on the edge of the Florida Current, larger survey vessels |

| | | | |
|---|---|---|---|
| | | | (coastal class or larger) are required. |
| (6) Dispersal, horizontal transport and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any; | Similar to the No Action Alternative. Currents are expected to be slightly less as the western boundary of the site is closer to shore. | Same as Alternative 1 | The strong northerly current of the Florida Current/Gulf Stream averages 1.3 m/s (2.5 knots), however varies considerably with reported current velocities from one to four knots (Taylor 2010; USEPA 2004). It was found that there is little possibility for sediment transport from the existing ODMDS, due to Florida current eddies, to impact any resource areas (USEPA 2004). |
| (7) Existence and effects of current and previous discharges and dumping in the area (including cumulative effects); | Same as No Action Alternative | Same as No Action Alternative | One previous disposal event has occurred at the existing site. Material was found to have moved beyond the northern boundary of the existing site. Chemical concentrations of many analytes were higher in sediments within the existing ODMDS than outside of the boundaries. |
| (8) Interference with shipping, fishing, recreation, mineral extraction, desalination, fish and shellfish culture, areas of special scientific importance and other legitimate uses of the ocean; | Same as No Action Alternative | Same as No Action Alternative | The existing ODMDS does not interfere with shipping, fishing, recreation or other legitimate uses of the ocean (USEPA 2004). This is not expected to change with the No Action Alternative. |

| | | | |
|---|---|---|---|
| (9) The existing water quality and ecology of the site as determined by available data or by trend assessment or baseline surveys; | Same as No Action Alternative | Same as No Action Alternative | Water quality of the existing site is typical of the Atlantic Ocean. The location of the Florida Current determines whether the site waters are predominately coastal or oceanic. The site supports a benthic and epibenthic fauna characteristic of upper continental slope habitat. |
| (10) Potentiality for the development or recruitment of nuisance species in the disposal site; | Same as No Action Alternative | Same as No Action Alternative | There are no components in the dredged material or consequences of its disposal that are expected to attract or result in recruitment of nuisance species to the ODMDS. |
| (11) Existence at or in close proximity to the site of any significant natural or cultural features of historical importance. | Surveys conducted in 2011 and 2012 did not identify any cultural features of historical importance. | Same as Alternative 1 | No significant cultural features were identified within the existing ODMDS. |

**Table 4. Summary of Direct and Indirect Impacts of Alternatives Considered.**

| ALTERNATIVE | Alternative Site 1 (Preferred Alternative) | Alternative Site 2 | No Action Alternative(Status Quo) |
|---|---|---|---|
| ENVIRONMENTAL FACTOR | | | |
| VEGETATION | N/A | | N/A |
| THREATENED AND ENDANGERED SPECIES | **Designation of either alternative for the Port Everglades Harbor ODMDS would have minor and temporary effects and would not jeopardize the continued existence of any threatened or endangered species -** 2004 Port Everglades Harbor ODMDS EIS concluded designation of (current) ODMDS would not adversely affect or threaten any protected species; No new threatened or endangered species found in either Alternative Site. | | No direct or indirect impacts |
| HARDBOTTOMS | **Designation of Alternative 1 could impact less potential hardbottoms** – Total area of potential hardbottom affected by estimated material deposition of 10 cm thickness or greater for Alternative 1 is 1.36 acres (0.05% of total area.) | **Designation of Alternative 2 could impact more potential hardbottoms** – Total area of potential hardbottom affected by estimated material deposition of 10 cm thickness or greater for Alternative 2 is 2.89 acres (0.12% of total area.) | No additional direct or indirect impacts |

| ALTERNATIVE | Alternative Site 1 (Preferred Alternative) | Alternative Site 2 | No Action Alternative(Status Quo) |
|---|---|---|---|
| ENVIRONMENTAL FACTOR | | | |
| FISH AND WILDLIFE RESOURCES | **Designation of either alternative would have only minor and temporary effects and would not jeopardize the continued existence of fish and wildlife resources -** Most larger fish species are highly mobile and can avoid the area during a disposal event; Smaller organisms have a prolific capacity to reproduce and any effect to the populations of these smaller species arising from the impacts resulting from a disposal event would be temporary and minor; The benthic community is highly dynamic and capable of recovering from short term perturbations such as a disposal event. | | No additional direct or indirect impacts |

| ALTERNATIVE | Alternative Site 1 (Preferred Alternative) | Alternative Site 2 | No Action Alternative(Status Quo) |
| --- | --- | --- | --- |
| ENVIRONMENTAL FACTOR | | | |
| ESSENTIAL FISH HABITAT | **Expanding the Port Everglades Harbor ODMDS may temporarily affect EFH and Federally managed fisheries -** Direct and indirect impacts to the water column and benthos will be mitigated through appropriate testing of the dredged material prior to disposal; Effects on Federally managed species include changes in habitat (sediment structure) for benthic organisms/ temporary and minimal impact on habitat/ not relevant due to absence of certain managed species in the expansion area. Alternative #1 includes area 2,721 acres in size, characterized by a homogenous mix sand/silt and clay. Alternative 1 covers less potential hardbottom within the project area. | **Expanding the Port Everglades Harbor ODMDS may temporarily affect EFH and Federally managed fisheries -** Direct and indirect impacts to the water column and benthos will be mitigated through appropriate testing of the dredged material prior to disposal; Effects on Federally managed species include changes in habitat (sediment structure) for benthic organisms/ temporary and minimal impact on habitat/ not relevant due to absence of certain managed species in the expansion area. Alternative 2 includes an area 2,449 acres in size with more potential hardbottom habitats within the project area. | No additional direct or indirect impacts |
| HISTORIC PROPERTIES | **There is no potential for submerged historic properties to be adversely impacted by the proposed expansion areas -** Two anomalies (one magnetic and two sidescan) were investigated. These anomalies anomalies were identified as debris and a modern, recent shipwreck. | | No direct or indirect impacts |

<table>
<tr><td>ALTERNATIVE</td><td>Alternative Site 1 (Preferred Alternative)</td><td>Alternative Site 2</td><td>No Action Alternative(Status Quo)</td></tr>
<tr><td>ENVIRONMENTAL FACTOR</td><td></td><td></td><td></td></tr>
<tr><td>ECONOMICS</td><td colspan="2">The selection of either alternative would not result in direct socio-economic impacts. Indirectly, selection of either alternative may have a positive socio-economic impact on marine transportation and military usage.</td><td>No direct or indirect impacts</td></tr>
<tr><td>RECREATION</td><td colspan="2">The selection of either alternative would not have any impacts to recreation - Few activities occur in, and none is restricted to, the proposed ODMDS.</td><td>No direct or indirect impacts</td></tr>
<tr><td>COASTAL BARRIER RESOURCES</td><td colspan="2">N/A</td><td>N/A</td></tr>
<tr><td>WATER QUALITY</td><td colspan="2">The selection of either alternative will have only temporary and minor impacts to water quality - During periods of dredged material disposal there will be temporary, localized increases in water column turbidity and concentrations of dissolved and particulate constituents. ; These effects will be dissipated by natural dispersion, mixing, and eventual sinking of particles.</td><td>No additional direct or indirect impacts</td></tr>
<tr><td>HAZARDOUS,TOXIC AND RADIOACTIVE WASTE</td><td colspan="2">N/A</td><td>N/A</td></tr>
<tr><td>AIR QUALITY</td><td colspan="2">N/A</td><td>N/A</td></tr>
<tr><td>NOISE</td><td colspan="2">N/A</td><td>N/A</td></tr>
</table>

| ALTERNATIVE | Alternative Site 1 (Preferred Alternative) | Alternative Site 2 | No Action Alternative(Status Quo) |
|---|---|---|---|
| ENVIRONMENTAL FACTOR | | | |
| NAVIGATION | **Selection of either proposed site would not impact navigation or public safety -** There are no designated shipping lanes or travel corridors near the Alternatives. Adequate public notice to mariners will be issued in advance of disposal events. | | No direct or indirect impacts |
| ENERGY REQUIREMENTS AND CONSERVATION | **As the proposed sites are essentially in the same location, the selection of either alternative would require the same amount of energy.** | | No direct or indirect impacts |
| NATURAL OR DEPLEATABLE RESOURCES | N/A | | No direct or indirect impacts |
| SCIENTIFIC RESOURCES | N/A | | No direct or indirect impacts |

# 3 AFFECTED ENVIRONMENT

The proposed ODMDS expansion area is at the edge of the Florida Current (also referred to as the Gulf Stream) and on the Florida-Hatteras Slope off the East Florida Escarpment. The Florida Current/Gulf Stream is formed by the merging of the Loop Current from the Gulf of Mexico and the Antilles Current from the Caribbean. The Florida Current/Gulf Stream flows northward (with intermittent reversals) through the Florida Straits to Cape Hatteras, North Carolina. The Florida Straits is a deep valley, approximately 75.6 nmi (140 km) wide, between Florida and the Bahamas Banks; the greatest depth is 4,921 ft (1,500 m) (Stommel 1965). Ocean currents tend to be driven by the Florida Current/Gulf Stream and cyclonic shear vorticity (circular wind-driven movement) along the western edge of the current. Frontal zones at the edge of the Florida Current/Gulf Stream are generally variable and unstable. The western Florida Current/Gulf Stream edge has horizontal wave-like meanders and submesoscale eddies with strong horizontal shear (Lee 1975; Shay *et al.* 1998). Figure 8 shows the project location in relation to major oceanic features that may affect the local currents and water quality.

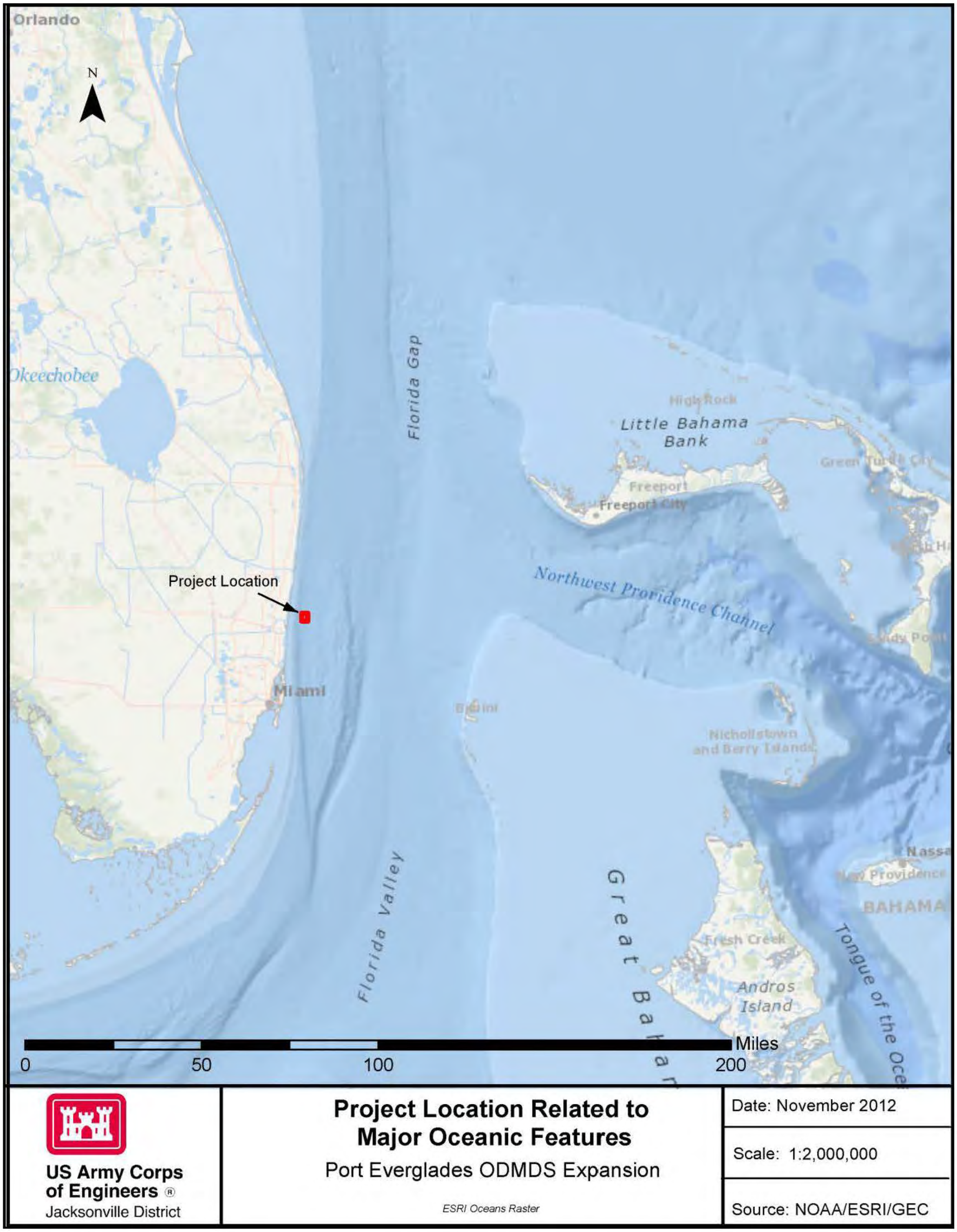


**Figure 8. Project location in relation to major oceanic features.**

## 3.1 SEDIMENT

Physical and chemical analyses were performed on sediment samples from the Port Everglades ODMDS and ODMDS proposed expansion area. Data collected from 1984 and 1998 were discussed in the FEIS for the designation of the Port Everglades ODMDS and are incorporated by reference (USEPA 2004). In 2006, a survey was conducted to map the spatial distribution of disposed dredged material on the seafloor in and north of the existing PE ODMDS and to characterize potential physical changes in the seafloor resulting from disposal (Germano & Associates, Inc. 2006). Data collected from physical and chemical analyses of sediment samples collected in 2007 (ANAMAR 2010) and 2011 (ANAMAR 2012) are included herein.

### 3.1.1 Physical Characteristics

In 2005, approximately 60,000 cy of dredged material was placed in the existing ODMDS consisting of fine sand with varying amounts of silt (Germano & Associates, Inc. 2006). A survey conducted in 2006 showed native surface sediment consisting of silty, very fine sand (grain size major mode of 4 to 3 phi) occurred at the majority of disposal site and reference stations, outside of the dredged material footprint. At stations within the dredged material footprint, the sediment appeared to have a slightly higher proportion of silty fine sand (as opposed to the silty, *very* fine sand comprising the native sediment type). Dredged material was observed in 22 of the 51 stations located within and north of the existing ODMDS, forming an uneven ellipse elongated in a north-south direction (Figure 9). The average thickness of the dredged material layer ranged from greater than 6.4 cm to trace amounts at some of the perimeter stations. The dredged material was distinguishable from the ambient surface sediments by its overall darker color, presence of a higher apparent proportion of fine sand (3 to 2 phi), presence of dark patches of silt, and/or presence of small white shell fragments (Germano & Associates, Inc. 2006).

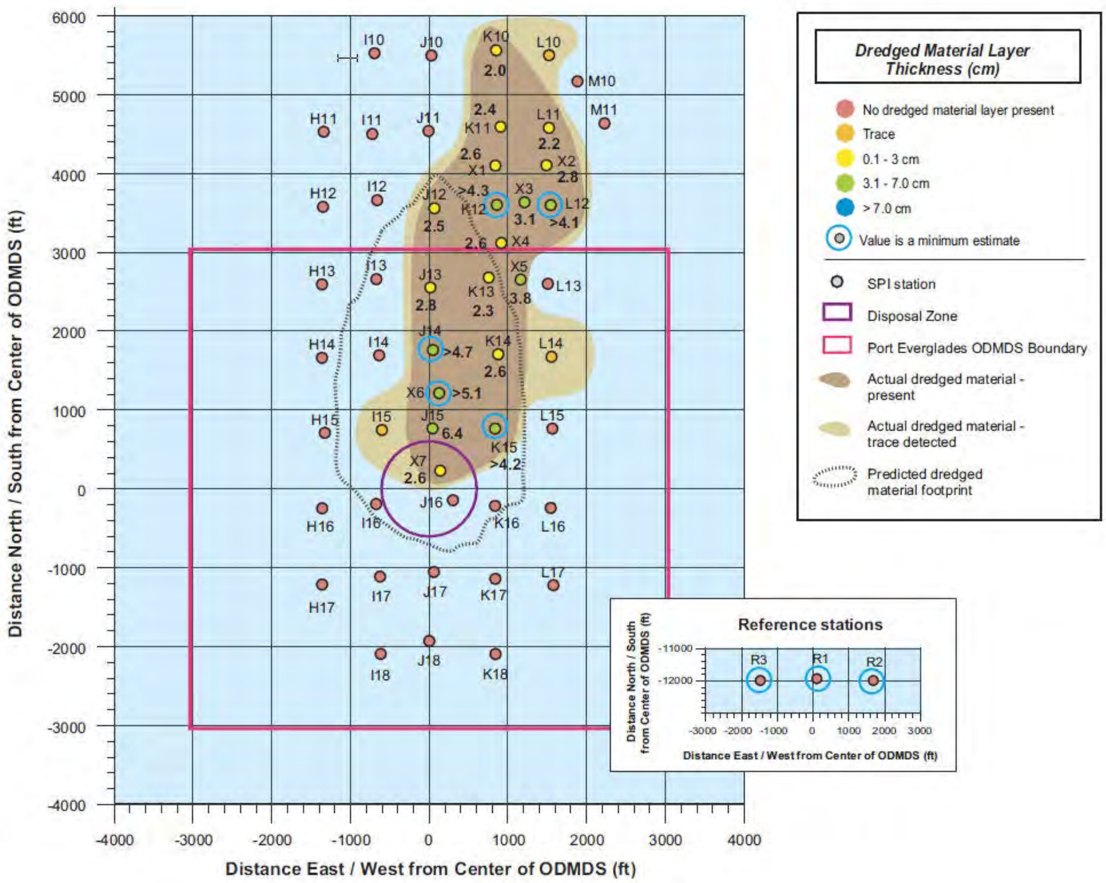

**Figure 9. Actual distribution of dredged material based on analysis of sediment profile images as compared with modeled results for the Port Everglades ODMDS (Germano & Associates, Inc. 2006).**

In 2007, sediment samples were collected from three stations to the north of the existing ODMDS (Figure 10). Samples ranged from 26.1% sand to 79.5% sand. The remainder was found to be predominantly silt with some clay, with less than 1% gravel for each sample.

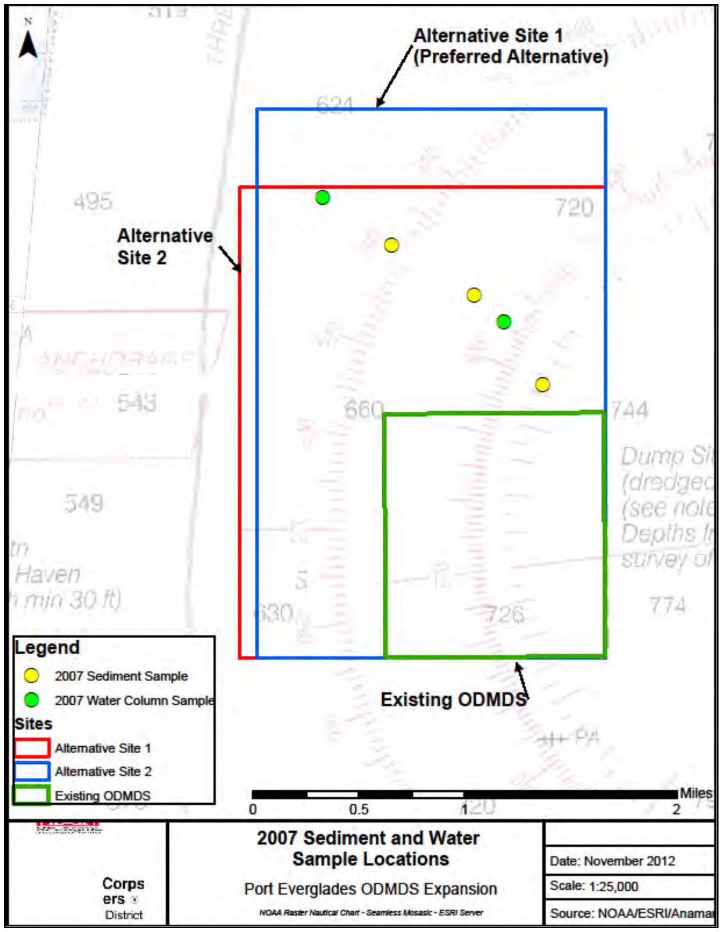


**Figure 10. 2007 Sediment and water sample locations.**

Sediments collected during the 2011 survey from five stations (including inside the existing ODMDS and both inside and outside the proposed expansion areas) show surface sediments contained primarily sand (55.7 to 64.9 percent, by weight); 49 to 54.3 percent of this was fine sand (Table 5). Silt and clay were also a major component of samples, representing 35.1 to 44.3 percent (ANAMAR 2012).

**Table 5. Summary of Sediment Grain Size Analysis in Relation to the Expansion Areas.**

| Location of Pooled Samples[1] | Percent Gravel[2] (Range) | Percent Sand[2] (Range) | Percent Silt and Clay[2] (Range) | USCS[3] Classification(s) |
|---|---|---|---|---|
| Inside ODMDS | 0.0 | 64.3 | 35.7 | SC-CM |
| Inside Expansion Areas | 0.0–0.0 | 55.7–64.9 | 35.1–44.3 | SC-CM (all samples) |
| Outside Expansion Areas | 0.0–0.0 | 58.3–63.6 | 36.4–41.7 | SC-CM (all samples) |

[1]Results of the ODMDS sample (Station PE11-1) were averaged with the field split sample.
[2]Particle sizes: gravel ≥4.750 mm, sand = 0.075–4.749 mm, silt and clay <0.075 mm
[3]USCS (Unified Soil Classification System) codes are: SC = clayey sand, SM = silty sand
Source: ANAMAR 2012

### 3.1.2 Chemical Analyses

When available, sediment chemistry results were compared to the Threshold Effects Level (TEL), which represents the concentration below which adverse effects are expected to occur only rarely, and the Effects Range-Low (ERL), which represents the value at which toxicity may begin to be observed in sensitive species. Results were also compared to the Apparent Effects Thresholds (AET), when available, which represent the concentration above which adverse biological impacts would always be expected by that biological indicator due to exposure to that contaminant alone (Buchman 1999). The Method Reporting Limit (MRL) is the threshold value below which the laboratory reports a given result as non-detected (ANAMAR 2012). A summary of organotin, metal and total organic carbon concentrations within the expansion alternatives is given in Table 6.

#### *3.1.2.1 Organotins, Metals, and Total Organic Carbon*

Sediments collected in 2007 showed organotins detected in all samples. Metals were detected but no metal exceeded the TEL or ERL in any sample. Sample concentrations for total organic carbon (TOC) ranged from 3.58% to 3.92% (ANAMAR 2010).

Samples collected in 2011 showed that the sample within the existing ODMDS had the highest detected concentration of all organotin as compared to inside and outside of the proposed expansion areas (ANAMAR 2012). The existing ODMDS also held maximum detected levels in 50 percent of the 10 metals tested. Inside the expansion areas held maximum detected levels in 40 percent of the 10 metals tested. The maximum detected concentration of chromium was observed outside the expansion areas. No sample approached the TEL, ERL, or AET values. The maximum detected concentration of TOC was from inside the expansion area at 0.87% (ANAMAR 2012).

**Table 6. Summary of Organotin, Metal and Total Organic Carbon Concentrations within the Expansion Alternatives .**

| Analyte | Range of Values (mg/kg) |
|---|---|
| Arsenic | 1.62–2.41 |
| Cadmium | 0.075–0.092 |
| Chromium | 10.7–12.4 |
| Copper | 2.24–2.70 |
| Lead | 1.720–2.080 |
| Mercury | 0.014–0.020 |
| Nickel | 10.1–13.6 |
| Selenium | 0.17–0.25 |
| Silver | 0.012–0.012 |
| Zinc | 3.9–4.3 |
| | **(%)** |
| Carbon, Total Organic | 0.309–0.868 |
| | **(µg/kg)** |
| Tri-n-butyltin Cation | <0.64–0.81 |
| Di-n-butyltin Cation | <0.28–<0.29 |
| N-butyltin Cation | <0.39–<0.39 |
| Total Organotins (as Sn) | 0.67–0.74 |

#### *3.1.2.2 Organochlorine Pesticides*

Pesticides were not detected in any sample collected in 2007 (ANAMAR 2010).

Samples collected in 2011 contained detectable amounts of pesticides inside the existing ODMDS. No detectable pesticide was found inside or outside the expansion area (ANAMAR 2012).

#### *3.1.2.3 Polynuclear Aromatic Hydrocarbons (PAHS)*

Samples taken in 2007 showed most PAHs were detected in at least some of the samples however no detected PAH exceeded the TEL or ERL (ANAMAR 2010).

The sample taken from the existing ODMDS during the 2011 survey held the maximum detected concentration in 14 of the same PAHs. This sample exceeded the TEL in four PAHs. No other sample had detected concentrations above the MRL. Five PAH analytes were detected inside and outside the expansion areas. PAHs detected inside and outside the expansion areas were present only in concentrations below the MRL (J-qualified) (ANAMAR 2012). A summary of PAH concentrations within the expansion alternatives is given in Table 7.

**Table 7. Summary of PAH Concentrations within the Expansion Alternatives .**

| Analyte | Range of Values |
|---|---|
| 1-Methylnaphthalene | <0.51–<0.51 |
| 2-Methylnaphthalene | <0.46–<0.46 |
| Acenaphthene | <0.76–<0.76 |
| Acenaphthylene | <0.59–<0.59 |
| Anthracene | <0.58–<0.58 |
| Benzo(a)anthracene | 0.78–1.1 |
| Benzo(a)pyrene | <0.76–<0.76 |
| Benzo(b)fluoranthene | 1.3–1.4 |
| Benzo(g,h,i)perylene | <0.85–0.87 |
| Benzo(k)fluoranthene | <0.87–<0.87 |
| Chrysene | <0.80–<0.80 |
| Dibenzo(a,h)anthracene | <0.80–<0.80 |
| Fluoranthene | 1.2–1.2 |
| Fluorene | <0.61–<0.61 |
| Indeno(1,2,3-cd)pyrene | <0.87–<0.87 |
| Naphthalene | <0.60–<0.60 |
| Phenanthrene | <1.4–<1.4 |
| Pyrene | 1.2–1.4 |
| Total LMW[1] PAHs | 4.9–4.9 |
| Total HMW[1] PAHs | 5.5–6.1 |
| Total PAHs | 14.9–15.6 |

[2]LMW = low molecular weight; HMW = high molecular weight.

#### *3.1.2.4 Polychlorinated Biphenyl (PCB) Congeners*

No PCB congener was detected above the MRL in any sample collected in 2007 (ANAMAR 2010).

In 2011, the sample taken from the existing ODMDS site had detectable concentrations in 14 of the 26 PCB congeners above the MRL (ANAMAR 2012). In contrast, none of the 26 PCB congeners tested were detected inside the expansion areas or in the surrounding area. No PCB concentrations exceeded the TEL, ERL, or AET in any sample (ANAMAR 2012).

## 3.2 VEGETATION

The proposed project involves only deepwater submerged habitat and the water column above it. There is no vegetation in the proposed ODMDS expansion area.

## 3.3 THREATENED AND ENDANGERED SPECIES

The Endangered Species Act (ESA) of 1973 (16 USC § 1531–1534) establishes protection and conservation of threatened and endangered species and the ecosystems upon which they depend. The U.S. Fish and Wildlife Service (USFWS) and the NOAA Fisheries Service (NOAA Fisheries) administer the ESA and may designate critical habitat for each species protected under the ESA. Under the ESA, an endangered species is defined as a species in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as a species likely to become an endangered species in the foreseeable future. Section 7 of the ESA requires all Federal agencies to consult with the USFWS or NOAA Fisheries, as applicable, before initiating any action that could affect a listed species. A Biological Assessment for the ODMDS expansion is included in Appendix B and was submitted to NOAA Fisheries to initiate consultation under Section 7. Information from the 2004 EIS for the ODMDS designation (USEPA 2004) is incorporated by reference. Threatened and endangered species that may occur in the ODMDS expansion area are listed in Table 8.

Critical habitat is a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. It is designated separately by USFWS or NOAA Fisheries under the ESA. Critical habitat may include an area that is not currently occupied by the species, but that will be needed for its recovery. There is no designated critical habitat in either of the expansion alternatives.

Table 8. Threatened (T) and Endangered (E) Species in the Project Vicinity (Source: NOAA Fisheries 2012; USFWS 2012).

| Common Name | Scientific Name | Federal Status |
|---|---|---|
| **Sea Turtles** | | |
| Green Turtle | *Chelonia mydas* | E |
| Loggerhead | *Caretta caretta* | T |
| Leatherback | *Dermochelys coriacea* | E |
| Kemp's Ridley | *Lepidochelys kempii* | E |
| Hawksbill | *Eretmochelys imbricate* | E |
| **Marine Mammals** | | |
| North Atlantic Right Whale | *Eubalaena glacialis* | E |
| Humpback Whale | *Megaptera novaeangliae* | E |
| Finback Whale | *Balaenoptera physalus* | E |
| Sei Whale | *Balaenoptera borealis* | E |
| Blue Whale | *Balaenoptera musculus* | E |
| Sperm Whale | *Physeter macrocephalus* | E |
| Florida Manatee | *Trichechus manatus latirostris* | E |
| **Fish** | | |
| Smalltooth Sawfish | *Pristis pectinata* | E |
| **Invertebrates** | | |
| Staghorn coral | *Acropora cervicornis* | T |
| Elkhorn coral | *Acropora palmata* | T |

### 3.3.1 Sea Turtles

Five of the six species of sea turtles in U.S. waters can be found in the proposed ODMDS expansion area and are federally protected under the ESA. These species include the green, loggerhead, leatherback, Kemp's ridley, and hawksbill sea turtles.

All sea turtles migrate at different times in their life, generally between feeding and nesting grounds. Sea turtles mate along the migratory corridor, at breeding stations, or near the nesting beach (Meylan and Meylan 1999). Females typically nest more than once per season, although generally not during consecutive years. Hatchlings migrate to the ocean, where they live for several years (Meylan and Meylan 1999). Growth rates are typically slow, and juveniles of most species migrate from the open ocean to coastal waters once they reach a certain size (Spotila 2004). Designated critical habitat for sea turtles is not found in the project vicinity.

Broward County is within the normal nesting and foraging area for loggerhead, green, and leatherback sea turtles; Kemp's ridleys and hawksbills nest in scattered locations and forage on adjacent reefs and nearshore hardbottoms (Meylan et al. 1995). In 2010, 2,283 loggerhead, 268 green turtle, and 14 leatherback nests were documented on Broward County beaches (FWRI 2011). A total of 2,565 nests were documented in 2010, the highest number of nests recorded since 2000 (Burney and Wright 2011). The beach and dune areas of John U. Lloyd Beach State Park have long been recognized as important sea turtle nesting areas. In 2010, sea turtle nests on Lloyd Beach included: loggerhead (202; density 51 nests/km), green (34; density 8.7 nests/km), and leatherback (2; 0.5 density nests/km) (Burney and Wright 2011).

#### *3.3.1.1 Loggerhead Turtle*

Loggerhead sea turtle (*Caretta caretta*). Adult loggerhead turtles average 3 feet in length and 250 pounds in weight. These highly migratory turtles can be found worldwide, inhabiting continental shelves, bays, estuaries, and lagoons in temperate, subtropical, and tropical waters. They are the most abundant sea turtle found in U.S. coastal waters. The loggerhead's range in the Atlantic is from Newfoundland south to Argentina

#### *3.3.1.2 Green Turtle*

Green sea turtle (*Chelonia mydas*). Adult green sea turtles can measure about 3 feet in length and weigh up to 350 pounds. Green sea turtles are globally distributed within tropical and subtropical waters. Along the Atlantic and Gulf coasts of the US, they can be found from Texas to Massachusetts and around the U.S. Virgin Islands and Puerto Rico. This species utilizes beaches for nesting, coastal areas for feeding and open ocean convergence zones. Threats to green turtles in the open waters associated with the proposed ODMDS sites include entanglement in trawl nets, longlines and lines associated with traps and pots. Green sea turtles may be present within the waters of the proposed expansion areas at various times of the year. Because this species is known to be an agile swimmer, individuals should be capable of avoiding the effects associated with a disposal event in either of the proposed ODMDS sites.

#### *3.3.1.3 Leatherback Turtle*

Leatherback sea turtle (*Dermochelys coriacea*). The leatherback is the largest living turtle and reptile in the world. Adult turtles average 5 feet in length but can grow to 6.5 feet and weigh up to 2,000 pounds. Their wide range includes tropical, subtropical and temperate waters of all major oceans where they feed on jellyfish and other soft-bodied prey. A minor nesting area is located along the southeast coast of Florida and individuals are observed in the adjacent offshore waters. There are mixed reports on the overall status of this species.

#### *3.3.1.4 Kemp's Ridley Turtle*

<u>Kemp's Ridley sea turtle</u> (*Lepidochelys kempii*). Kemp's Ridley sea turtle is the smallest of the sea turtles with adults are typically weighing up to 100 pounds in weight and are about 2 feet in length. They can be found mainly in the Gulf of Mexico and along the U.S. Atlantic coast. The Kemp's Ridley sea turtle has been in decline many years. In one day of nesting in 1947, approximately 42,000 females were counted on a beach in Mexico. From 1973 to 1991 the number of nests declined to approximately 200 per year. This species is found in submerged habitats where there is muddy or sandy substrate where they feed on crabs, fish and mollusks.

#### *3.3.1.5 Hawksbill Turtle*

<u>Hawksbill sea turtle</u> (*Eretmochelys imbricata*). Hawksbill sea turtles are small to medium sized. Nesting females average 2 to 3 feet in length and typically weigh up to 200 pounds. The hawksbill sea turtle occurs in the tropical and sub-tropical waters of the Atlantic, Pacific, and Indian Oceans. They are most commonly associated with coral reefs however juveniles are thought to spend time in the pelagic environment. They are observed with regularity on the reefs off of Palm Beach, Broward, Miami-Dade and Monroe Counties where the warm Florida Current/Gulf Stream current passes close to shore. Population estimates and trends are difficult to determine due to its habit of solitary nesting.

### 3.3.2 Marine Mammals

Six cetaceans that may occur in the vicinity of the proposed ODMDS expansion area are Federally listed as endangered: North Atlantic right whale, humpback whale, fin whale, sei whale, blue whale, and sperm whale.

Although the Florida manatee is found in inshore waters of Broward County, due to the depths of the ODMDS expansion areas and distance from shore, manatees are unlikely to be found in the ODMDS expansion areas.

### 3.3.3 Smalltooth Sawfish

The smalltooth sawfish is the only federally listed fish species potentially occurring in the vicinity of the proposed ODMDS expansion area. This species matures at 10 years of age and can reach 25 ft. in length and an age of 30 years. This species is relatively common in the Everglades region of Florida, but the population has been restricted to peninsular Florida. Sawfish inhabit shallow coastal waters and are generally found very close to shore in muddy and sandy bottoms, seldom descending to depths greater than 10 m. Current records from the east coast of Florida remain relatively scarce compared to the west coast, Florida Bay, and the Florida Keys. Encounter data have also demonstrated that smaller smalltooth sawfish occur in shallower water, and larger sawfish occur regularly at depths greater than 32 ft (10 m), frequently between 200 to 400 ft (70 to 122 m) (NOAA Fisheries 2010).

### 3.3.4 Elkhorn and Staghorn Coral

Staghorn (*Acropora cervicornis*) and elkhorn coral (*A. palmata*) are threatened species. Atlantic acroporids are found typically in shallow water on reefs throughout the Bahamas, Florida and the Caribbean where water temperatures range from 66 to 86°F. Acroporids live in high-energy zones, with a lot of wave action. Corals depend on symbiotic zooxanthellae for food; zooxanthellae need sunlight to photosynthesize.

Elkhorn and staghorn corals generally have the same geographic distribution, with a few exceptions. The maximum northern extent (Palm Beach County, Florida) of staghorn coral occurrence is farther north than that of elkhorn coral (Broward County, Florida). Staghorn coral commonly grows in more protected, deeper water in depths from 5 to 20 m, rarely to 60 m. Elkhorn coral commonly grows in turbulent shallow water on the seaward face of reefs in depths from 1 to 5 m, but has been found to 30 m depth.

Critical habitat for elkhorn and staghorn corals in the Florida Unit was designated in 2008 and includes the Atlantic Ocean offshore of Broward County (Figure 11). Within these water depths, NOAA Fisheries has defined that, ‘‘substrate of suitable quality and availability’’ is equivalent to consolidated hardbottom or dead coral skeleton that is free from fleshy macroalgae cover and sediment cover (NOAA Fisheries 2008).

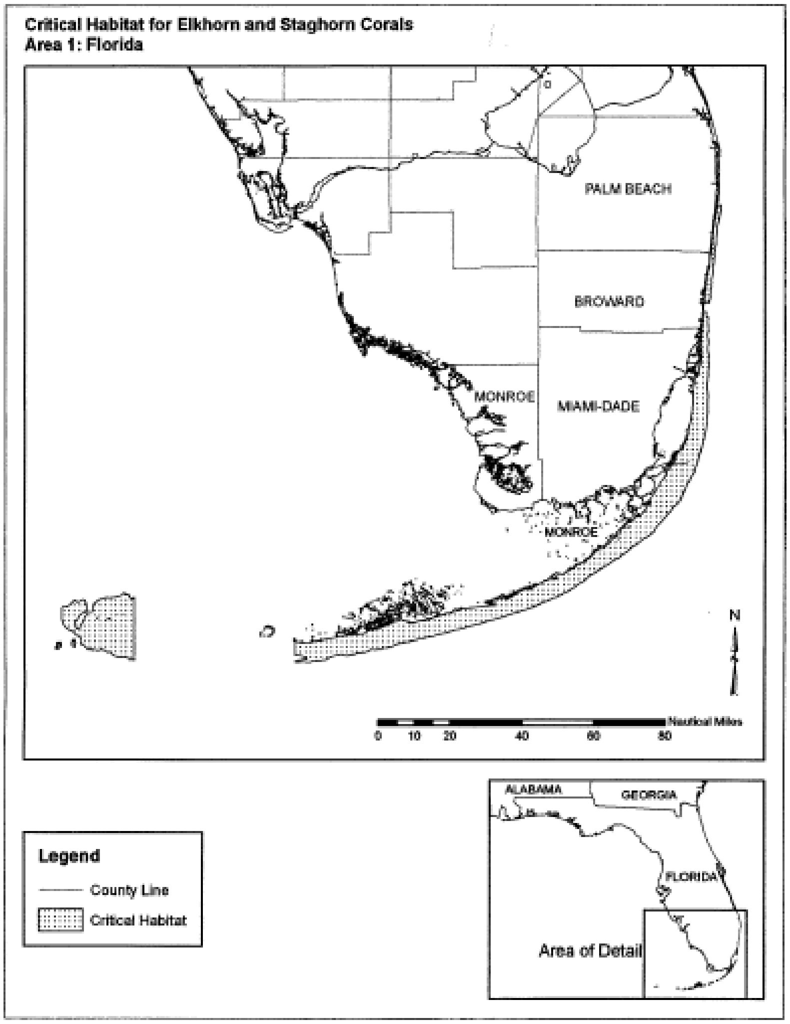


**Figure 11. Designated critical habitat for Elkhorn and staghorn corals in the Florida Area**

The channel walls and bottom are not designated critical habitat (NOAA Fisheries 2008) because they are considered part of a "maintained channel" as detailed in 50 CFR §226.216 (c)(2). Also, an area south of Port Everglades referred to as the "Dania RAA" was excluded from the DCH under 50 CFR §226.216(d). This area abuts the south side of the existing federal channel approximately 300 feet south of the channel, creating a 7.45 acre strip of DCH on the south side of the channel. The ODMDS expansion areas are located about 1.8 nmi from the nearest *Acropora* critical habitat (Figure 12).

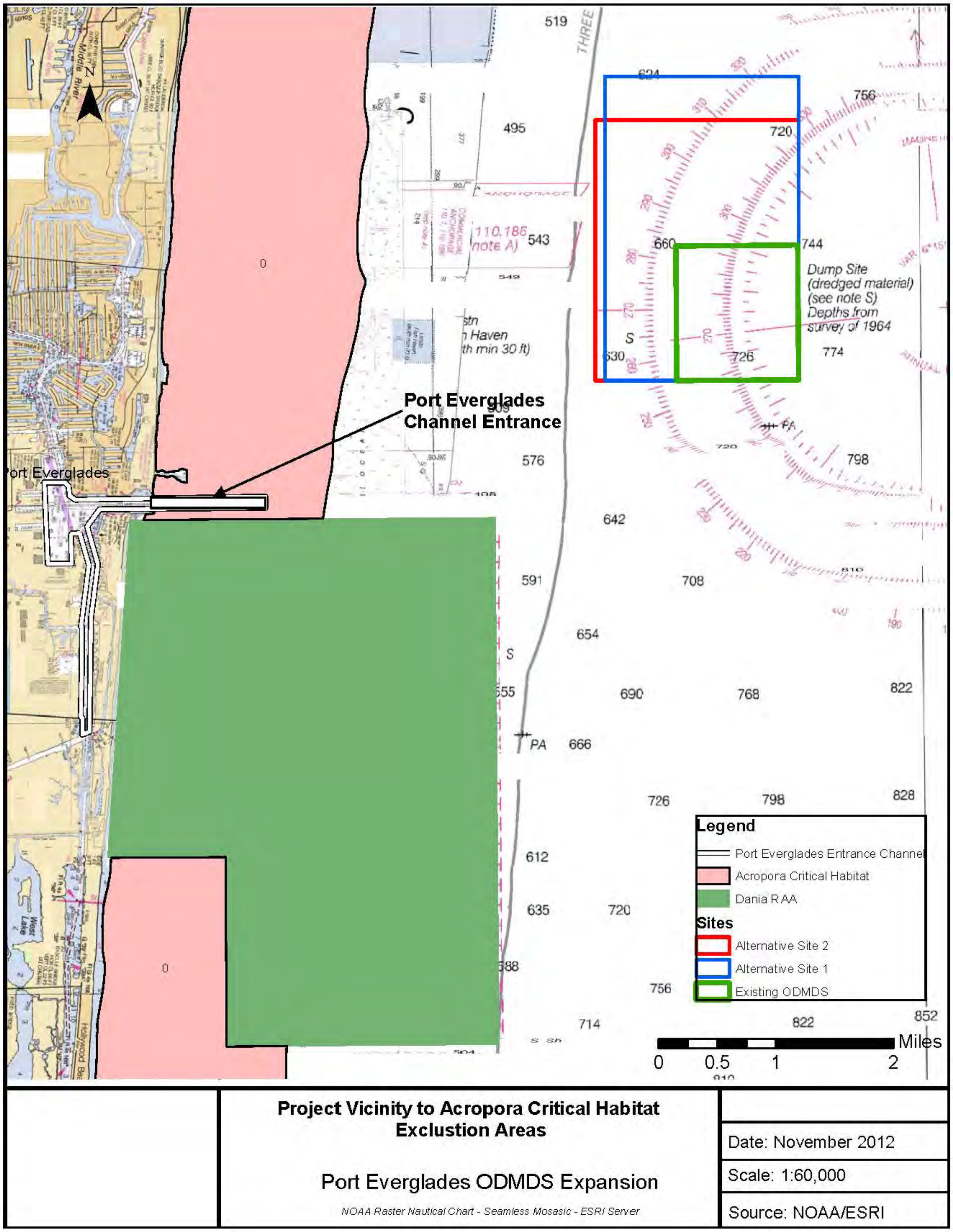


**Figure 12. Project Vicinity in reference to Acropora Critical Habitat and Exclusion Areas**

## 3.4 HARDBOTTOM HABITATS

Hardbottom habitats (hardgrounds or *live bottoms*) are areas of rock or consolidated sediment that can be distinguished from surrounding unconsolidated sediments. These habitats can vary in topography from a relatively flat, smooth surface to a scarped ledge with stepped relief. The extent and diversity of colonization also vary according to topography, habitat diversity, currents, light availability, and location on the shelf. Hardbottom habitats provide habitat, food, and shelter to a large variety of organisms, including sponges, mollusks, crustaceans, sea worms, echinoderms, sea turtles, and many species of fishes (CSA International, Inc. 2009). Although uncolonized hardbottom habitats do not support attached faunal organisms, they are biologically important as fish refuge habitat. Hardbottoms also provide substrate for corals. Corals and coral reefs are managed by the South Atlantic Fisheries Management Council (SAFMC). Coral and coral reef EFH and Coral Habitat Areas of Particular Concern (CHAPCs) are discussed in more detail in Section 3.6.

The classic reef distribution pattern described for southeast Florida reefs (north of Key Biscayne) consists of an inner reef in approximately 15 to 25 ft (4.6 to 8 m) of water, middle patch reef zone in about 30 to 50 ft (9 to 15 m) of water, and an outer reef in approximately 60 to 100 ft (18 to 30 m) of water (Duane and Meisburger 1969; Goldberg 1973; Courtenay *et al.* 1974; Lighty et al. 1978; Jaap 1984). These reef zones are separated by areas of sand or sand and rubble. The overall hardground assemblage of hard corals, soft corals, and sponges along southeast Florida's offshore reefs is very consistent (Blair and Flynn 1989). However, the hard coral species density decreases northward from Dade County to Palm Beach County. Broward County had 21 species of stony coral in 2010 reef surveys (Gilliam 2011).

Stony corals can be divided into corals containing zooxanthellae (dinoflagellate algae of the genus *Symbiodinium*) in their tissues (zooxanthellate corals) and corals without zooxanthellae (azooxanthellate corals). Zooxanthellate species are restricted to the photic zone and are typically found in tropical-subtropical regions at depths that rarely exceed 230 ft.

Azooxanthellates (ahermatypic corals) do not have an obligate relationship with zooxanthellae (symbiotic algae) and can live in deep water. Ahermatypic coral are widespread, but are most common in cooler, deep water (down to 20,669 ft) or in cryptic, shallow-water environments such as caves and the undersurfaces of rock ledges (Wells 1956). Ahermatypic corals require hard substrate to settle and survive. Two types of deepwater coral reefs, *Oculina* and *Lophelia*, are found off the coast of the southeastern U.S., primarily between Florida and North Carolina. The geomorphology and functional structure of these deepwater coral reefs are similar, but they occur at different depths. Deepwater ivory tree coral (*Oculina varicosa)* coral reefs are found at depths of 230 to 328 ft (70 to 100 m) along the shelf edge of central eastern Florida (Reed and Farrington 2010). *Lophelia/Enallopsammia* coral mounds are found from north Florida to Miami at depths of 1,312 to 2,624 ft (400 to 800 m) (Reed and Farrington 2010). The most widespread deepwater stony coral, white coral *(Lophelia pertusa)* forms reefs in 1,640 to 2,854 ft (500 to 870 m) depths in the Straits of Florida (Reed 2001). The original ODMDS was sited to avoid hardbottom (USEPA 2004), and the nearest nearshore natural reef is 1.08 nmi west of the ODMDS expansion areas (Figure 13).

A survey was done for the now-defunct Tractebel Calypso Pipeline Project in 2004 of the region to the west of the proposed ODMDS expansion area. The overlap of the ODMDS expansion area and the Calypso Pipeline survey area (USCG 2008) was primarily soft bottom; however, a small area of hardbottom was reported (Figure 14). Along this area, Nova Southeastern University (NSU) scientists observed 1 to 2 foot diameter boulders, anemones, sponges, hydroids, and mud bottom with signs of bioturbation (NOAA Fisheries 2011).

Navy multi-beam bathymetry data in 2001 within the proposed expansion area indicated some areas with low relief that gave the appearance of hardbottom. However, none of these areas were confirmed (B.K. Walker, National Coral Reef Institute, letter dated April 18, 2011). NSU scientists evaluated more recent sidescan data and identified several areas with either a high or medium probability of supporting hardbottom features inside the expansion area (NOAA Fisheries 2011). These areas are shown on Figure 15. The areas of suspected hardbottom identified by NSU in the ODMDS expansion areas were sampled during the site designation study by the USEPA's Ocean Survey Vessel Bold, in May 2011 (ANAMAR 2012). The OSV Bold conducted a survey of the site that included taking sediment profile and plan view images of the seafloor at 49 stations.

A total of 85 photographs were taken from the 33 stations within the areas identified as potentially containing hardbottom by NSU. Each photograph covered an area approximately 300 cm long by 200 cm wide for a total coverage of 60,000 $cm^2$. Areas of limited hardbottom were observed, primarily in the northernmost suspected hardbottom area. Relief was only noted at three of the stations (SPI-48, SPI-53, and SPI-39) indicated in bold yellow in Figure 15. At each of these stations, the relief was only observed in one of the three replicate photographs, indicating that the area of relief was spatially limited. The photos with relief comprised 1% of the bottom *sampled* over the areas classified as either high or medium potential for the presence of hardbottom. No corals were observed in the photographs. Several examples of these images are provided in Figure 16 through Figure 19.

The limited rubble bottom located during the survey was concentrated in the northernmost suspected hardbottom area. In addition, epifaunal trawl samples were taken inside and outside the ODMDS expansion areas. One trawl sample in the ODMDS expansion area included cobble-sized carbonate rocks and several pieces of rose coral (*Manicina* sp.) that had apparently been dead for a long period. No live hard corals (Scleractina) were found in any trawl samples (ANAMAR 2012).

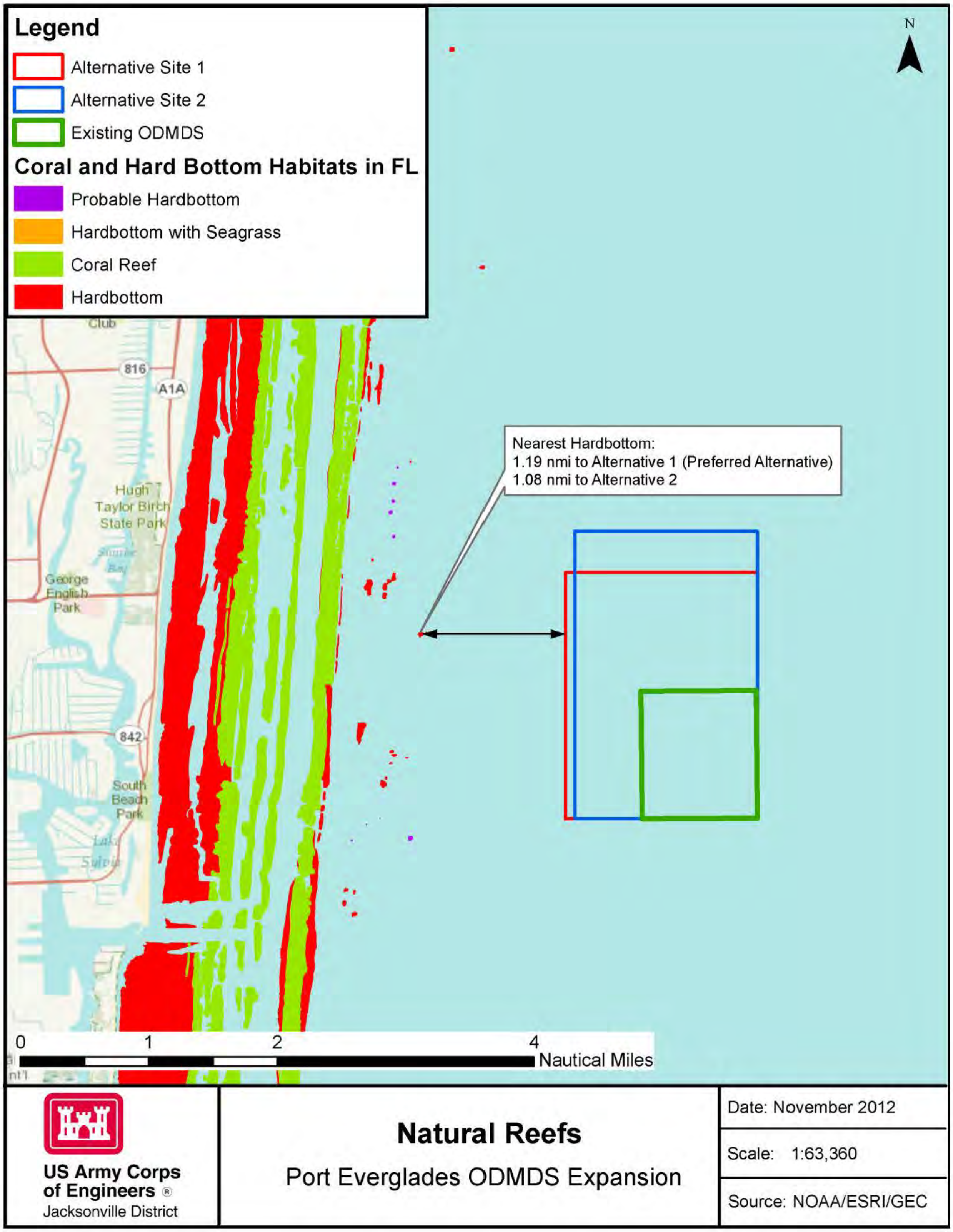


**Figure 13. Natural reefs, including both coral reefs and hardbottom, in the project vicinity. The closest hardbottom habitat as mapped by Broward County is approximately 1.08 nautical miles from Alternative 2, the Alternative located furthest west.**

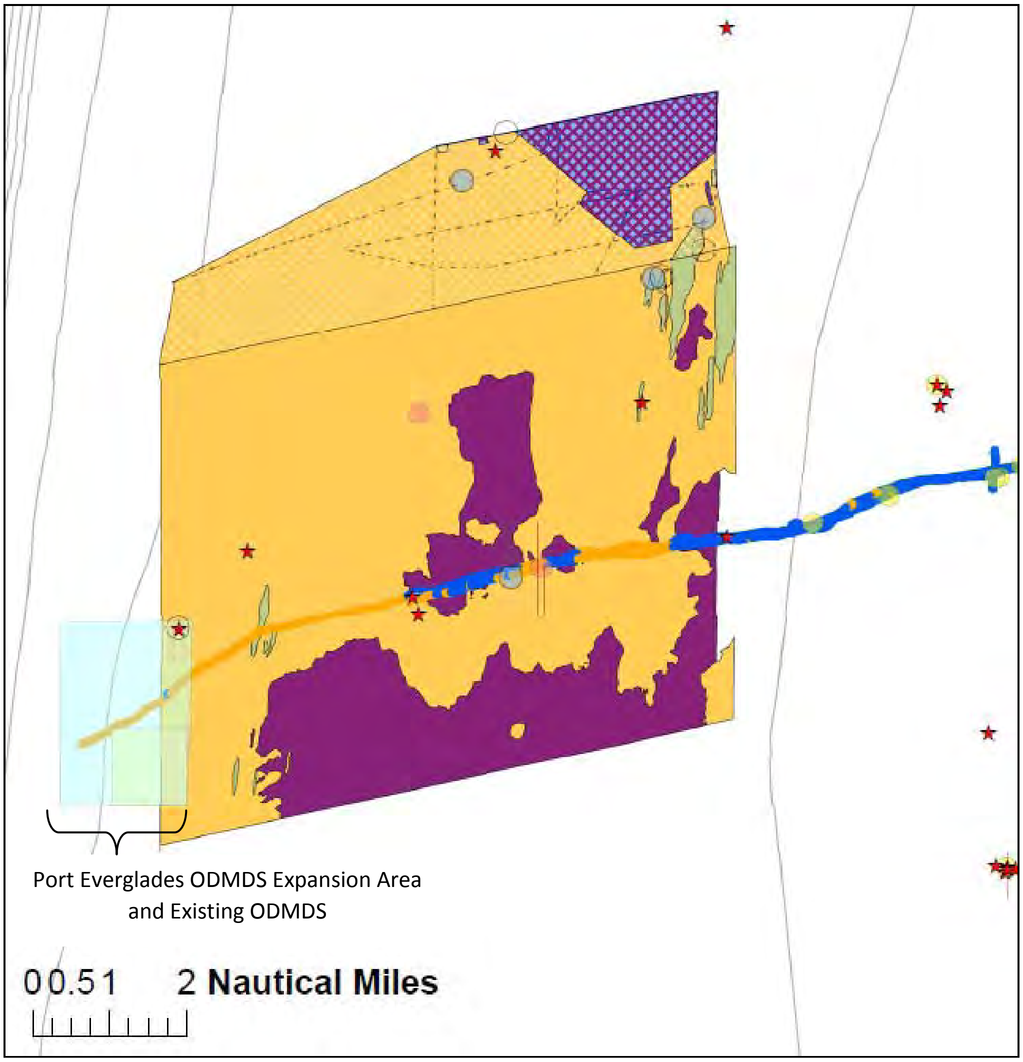


**Figure 14. Hardbottom Adjacent to ODMDS Expansion Areas. The existing ODMDS and proposed expansion area are shown in light blue; the tan polygons and lines indicate soft bottom; dark blue indicates areas of rock or hardbottom; the red stars note tilefish; and the red star in the upper right corner of the ODMDS expansion area is a possible shipwreck. Figure provided by Mr. John Reed (HBOI/FAU) (NOAA Fisheries 2011).**

NOAA Fisheries provided initial comments on the project following the Project Scoping Meeting in a letter dated May 16, 2011 (NOAA Fisheries, 2011). Their primary concerns related to potential impacts to EFH and threatened and endangered species. USEPA has prepared an EFH Assessment and Biological Assessment (BA) for this action (see Appendices B and C) and is in the consultation process with NOAA Fisheries under both of the applicable statutes. Site designation will not be finalized until the EFH and ESA consultations have been completed.

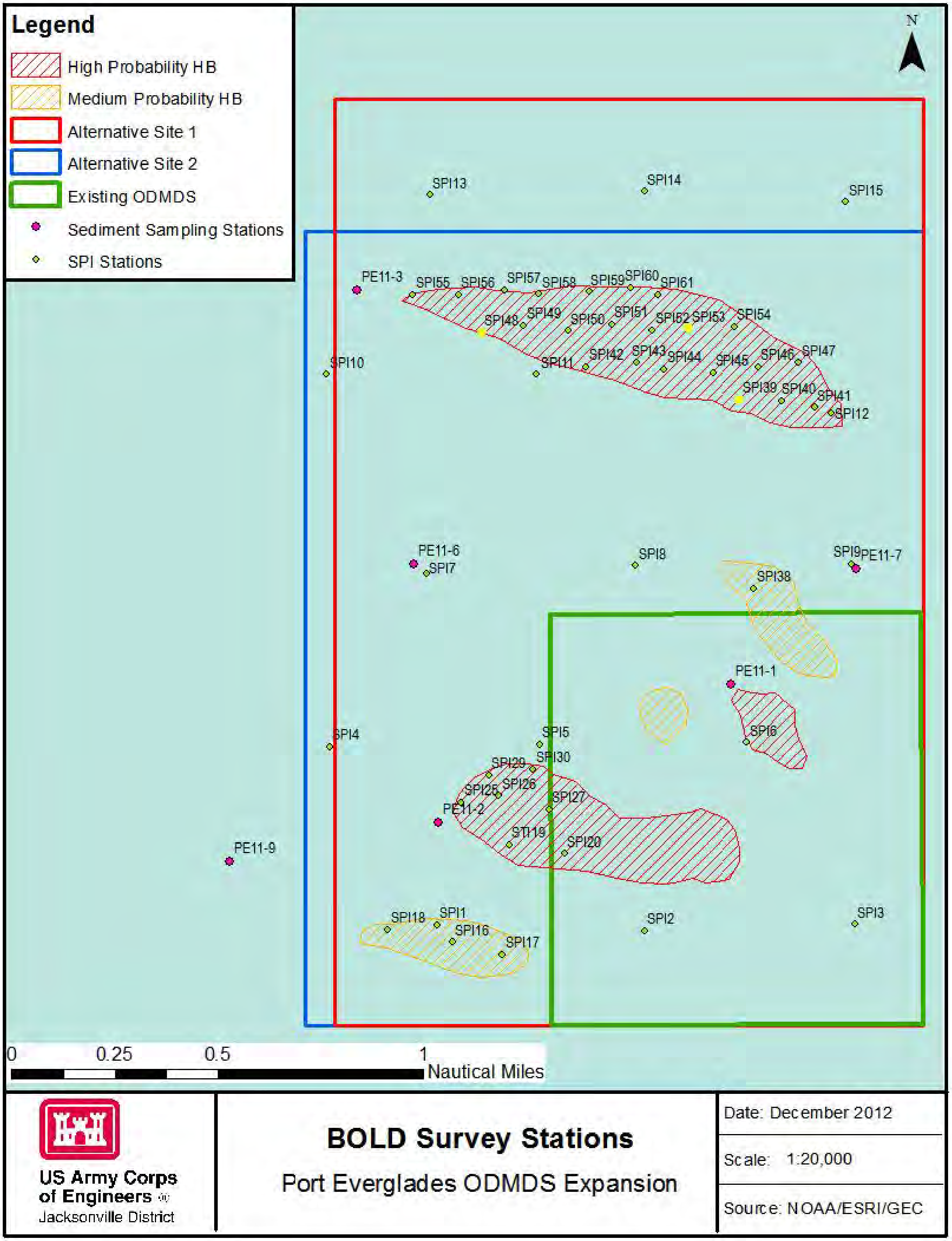


**Figure 15. Graphic showing the location of potential hardbottom areas identified by Nova Southeastern University, and the location of the sediment profile and plan view image stations corresponding with the photos provided in Figures 10 through 13.**

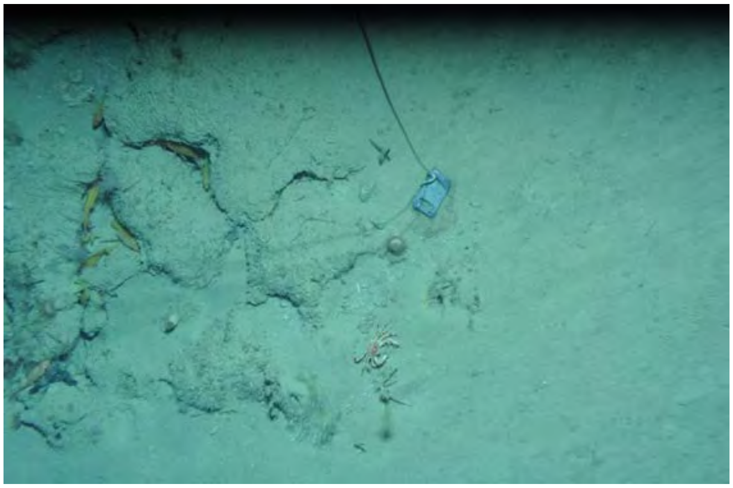


**Figure 16. Plan and profile views of hardbottom at sampling station SPI 53 (see Figure 15) in suspected high probability hardbottom area in the proposed ODMDS expansion area.**


**Figure 17. Plan and profile views of hardbottom at sampling station SPI 39 (see Figure 15) in suspected high probability hardbottom area in the proposed ODMDS expansion area.**

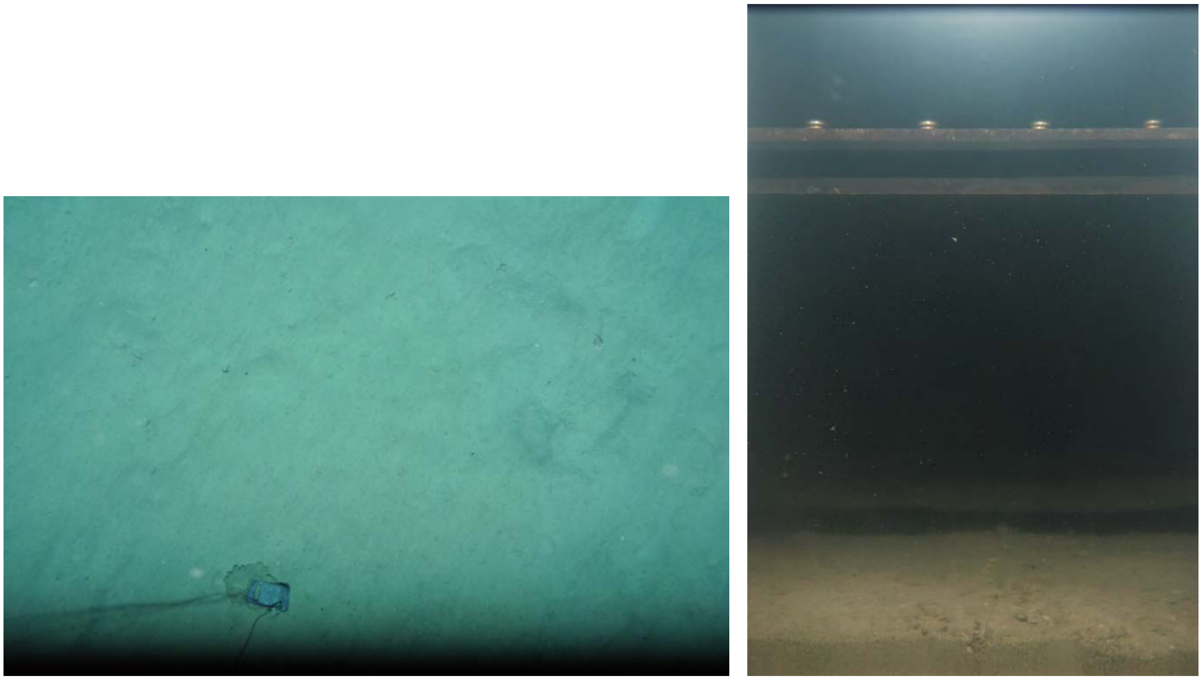

**Figure 18. Plan and profile views of hardbottom at sampling station SPI 49 (see Figure 15) in suspected high probability hardbottom area in the proposed ODMDS expansion area.**

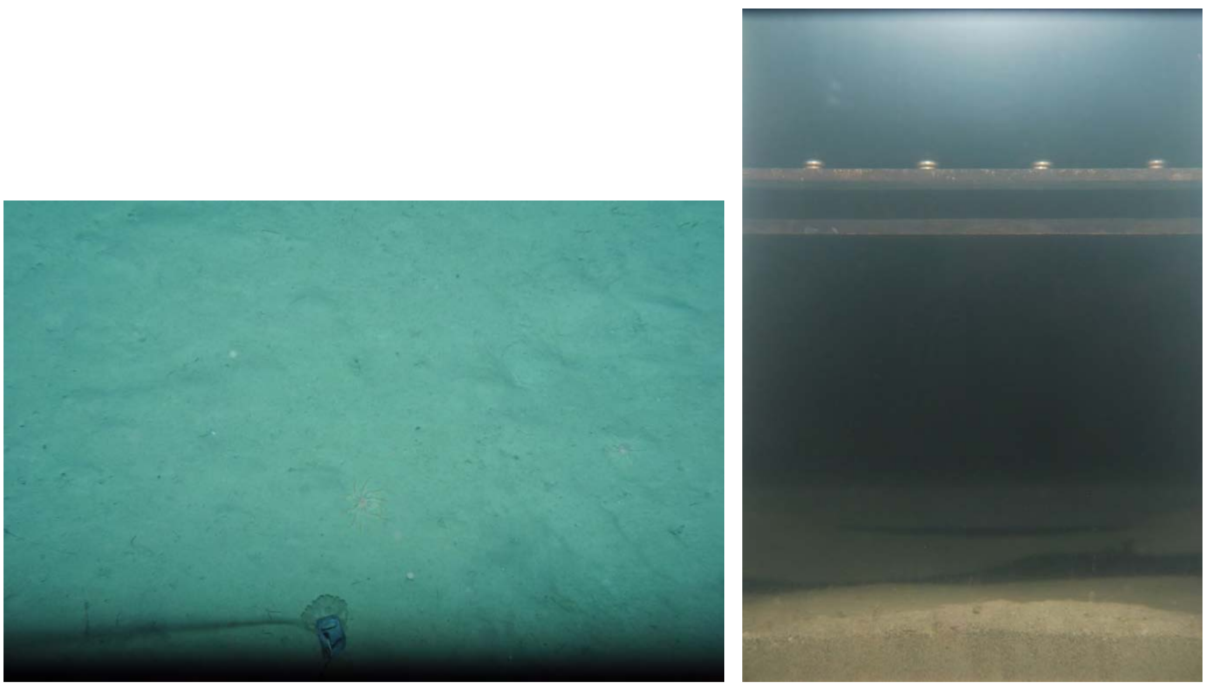

**Figure 19. Plan and profile views of hardbottom at sampling station SPI 30 (see Figure 15) in suspected high probability hardbottom area in the proposed ODMDS expansion area.**

In an effort to review all potential data sources to identify hardbottoms, USACE reviewed the side-scan sonar data collected for the cultural resource assessment to determine if any features were denotable on the bottom. Data was collected using at a frequency of 100 kilohertz and

150 meter range. To be as conservative as possible, USACE and EPA classified all non-manmade targets detected in the survey as “hardbottom” (Figure 20, Figure 21). The size of each target was calculated and the total area of potential hardbottom tabulated for both alternatives. Based on this analysis, Alternatives 1 and 2 each contain 12.85 acres of potential hardbottom within the total footprint of the expansion areas.


**Figure 20. Potential Hardbottom Targets in Alternative 1**

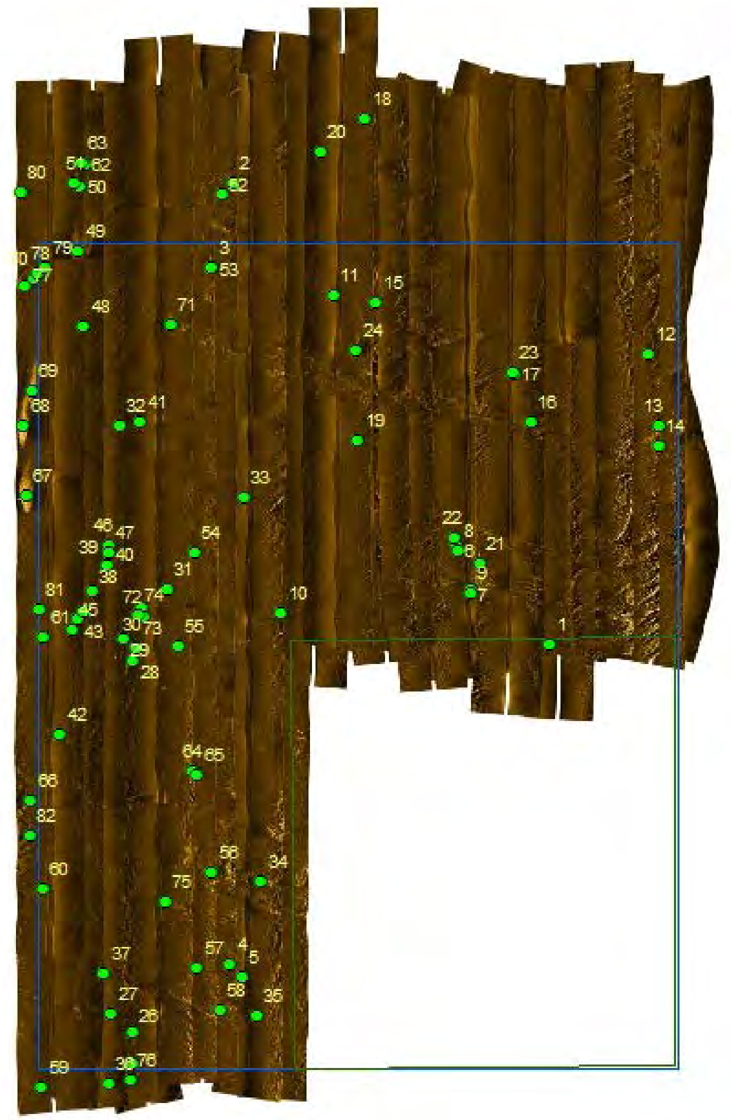


**Figure 21. Potential Hardbottom Targets in Alternative 2**

## 3.5 FISH AND WILDLIFE RESOURCES

### 3.5.1 Marine Habitats

#### *3.5.1.1 Water Column*

Detailed discussions about the water column, flora and fauna that reside in the water column are included in Sections 3.5.1; 3.5.2 and 3.5.4 of the Designation FEIS and are incorporated by reference.

The water column provides habitat for small (such as plankton) and larger (such as fish, marine mammals, and sea turtles) marine life. Temperature, salinity, density, nutrient, and light gradients in the water column create distinct habitats (Barnette 2001; SAFMC 1998), providing environments suitable for various life stages of different species (SAFMC 1998). On the east coast of Florida, these distinctions are influenced by the Florida Current, which flows along the continental shelf edge throughout the region and dominates the physical attributes over the entire shelf (see Figure 8; SAFMC 1998). The western edge of the Florida Current meanders from far offshore onto mid-shelf. The existing ODMDS is located about 3.8 nmi (7 km) from the average position of the western boundary of the Florida Current (USACE 2001). Characteristics of the water column are discussed in Section 3.8.

Pelagic species of the brown seaweed *Sargassum* are an important habitat in the water column and near-surface waters. Most pelagic *Sargassum* circulates between 20°N and 40°N latitude, and between 30°W longitude and the western edge of the Florida Current. Pelagic *Sargassum* generally consists of two species, *S. natans* (primarily) and *S. fluitans* (less common). Large quantities of *Sargassum* are frequently found on the continental shelf off the southeastern U.S. *Sargassum* supports a diverse assemblage of marine organisms, including fungi, macro- and micro-epiphytes, at least 145 species of invertebrates, over 100 species of fish, 4 species of sea turtles, and numerous marine birds. *Sargassum* provides refuge from predators for small species and early life stages; these organisms also feed on the *Sargassum* and associated invertebrates. *Sargassum* provides an abundant food source, attracting larger species. *Sargassum* is a habitat type managed by the SAFMC as EFH (Section3.6; SAFMC 1998). Pelagic *Sargassum* was frequently observed during recent surveys of the ODMDS expansion area (ANAMAR 2012).

#### *3.5.1.2 Benthic Habitat*

Benthic habitats are characterized by physical or structural features, including topography, substrate type, sediment grain size, and water depth, and by the presence of emergent biogenic structures (formed by plants or animals), including coral reefs, mussel beds, and tube assemblages (Tyrrell 2005). Recent bottom surveys conducted in the proposed ODMDS expansion area (ANAMAR 2012) determined that the area was primarily soft bottom, with isolated areas of scattered rubble (see Section 3.4).

The structural foundation of sand and mud in soft bottom (sedimentary) areas can be enhanced by sand waves or shell aggregations created by physical processes, and by tube assemblages, burrows, or depressions created by plants or animals (Lindholm *et al*. 1998). Soft bottom habitats contain epifaunal (organisms that live on the sediment), infaunal (organisms that live within the sediment), and pelagic (free-swimming organisms that migrate in and out of the area) assemblages, whereas hardbottom habitats typically contain only epifaunal and pelagic assemblages.

### 3.5.2 Areas of Special Concern

#### *3.5.2.1 Marine Protected Areas*

The existing ODMDS and the proposed expansion area are located in a Fishery Management Area called the East Florida Coast Closed Area (MPA;Figure 22). MPAs are defined under Executive Order (EO) 13158 as *any area of the marine environment that has been reserved by Federal, state, tribal, territorial, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein*. MPAs are generally defined where natural or cultural resources are given greater protection than the surrounding waters; and they include a range of habitats, restrictions, and management approaches (NMPAC 2006). The East Florida Coast Closed Area is a Federal Fishery Management Zone, and is not restricted to vessels or to anchoring. A number of other MPAs are located in the vicinity of the project area, as shown on Figure 22.

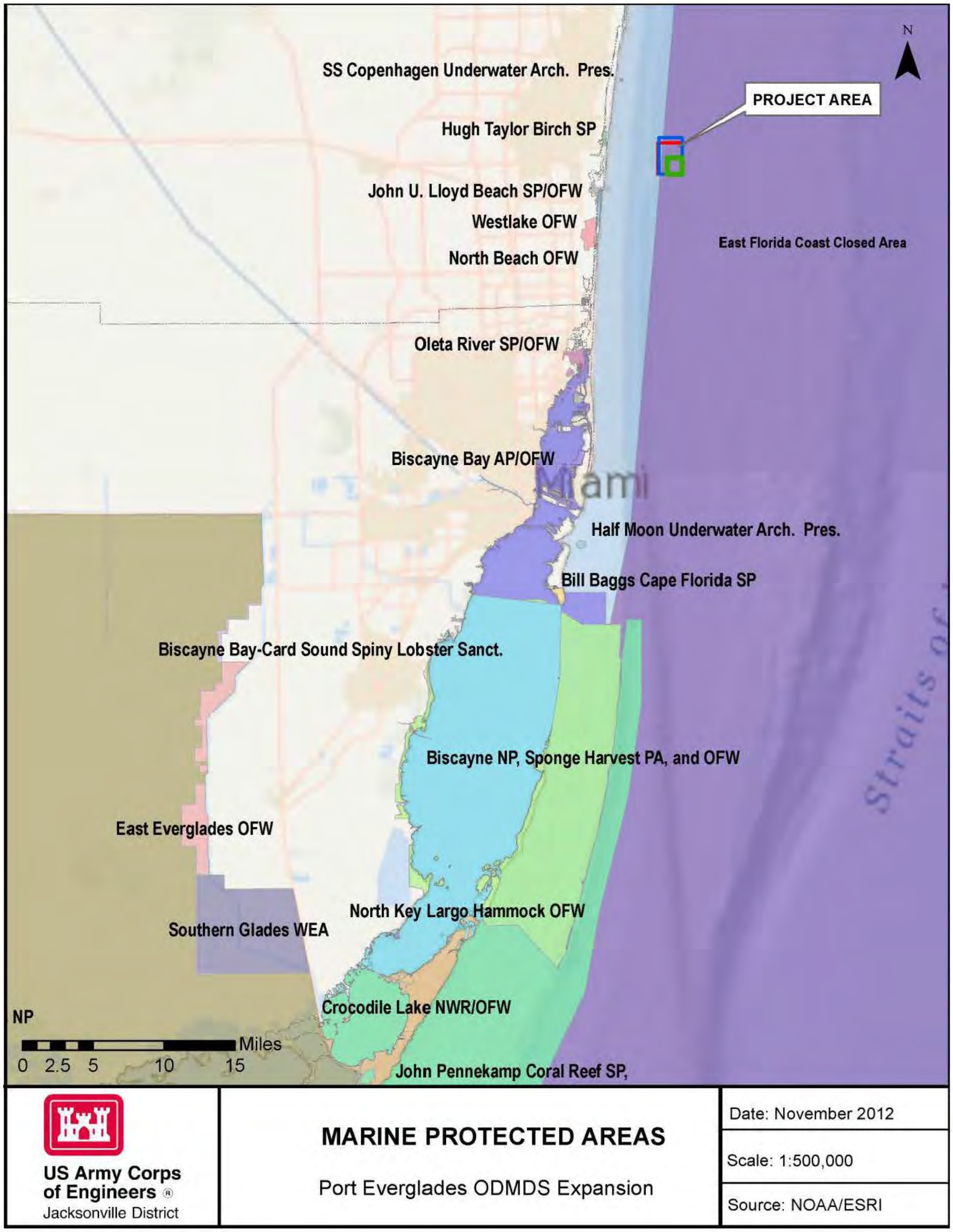


**Figure 22. Marine Protected Areas (MPAs) in the Southeast Florida region. The East Florida Coast Closed Area, a Federal Fishery Management Zone, is located within the project boundaries.**

#### *3.5.2.2 Reef Tracts*

There are no reefs within the proposed ODMDS expansion areas (Section 3.4). The *continental Southeast Florida reef tract* extends 67.5 nmi (125 km) from Biscayne Bay in Miami-Dade County (25°34'N) northward to West Palm Beach in northern Palm Beach County (26°43'N). It is composed of a complex of limestone ridges and shelf-edge and mid-shelf reefs (Banks *et al.* 2008). The *Florida Reef Tract* includes the region south of Soldier Key to the Dry Tortugas (Vaughan 1914).

#### *3.5.2.3 Critical Habitat and Habitat Areas of Particular Concern*

Critical habitat is discussed in Section 3.3(Threatened and Endangered Species). Habitat Areas of Particular Concern (HAPCs) are discussed in Section 3.6 (EFH).

### 3.5.3 Marine Mammals

Although 24 species of marine mammals could potentially occur in the proposed ODMDS expansion area (Table 9), many are considered rare or uncommon in Florida's Atlantic marine waters (ASM 2012). All marine mammals that may be found near the project area are protected under the Marine Mammal Protection Act (MMPA) of 1972 and/or the ESA. The north Atlantic right whale, humpback whale, fin whale, sei whale, blue whale, and the sperm whale are the six federally listed marine mammals that could occur in the area. Federally listed threatened and endangered species were discussed in Section3.3.

The bottlenose dolphin and the Atlantic spotted dolphin are the two marine mammals most likely to occur in the proposed ODMDS expansion areas (NOAA 2005). Other species are listed in Table 9 and will not be discussed. Many of these stocks are managed as depleted under the MMPA. Numbers of whales and dolphins reported stranded in Broward County from 1978 to 2011 include: bottlenose dolphin (12), pygmy sperm whale (9), dwarf sperm whale (6), Risso's dolphin (5), Gulf stream beaked whale (3), Atlantic spotted dolphin (4),Pan-tropical spotted dolphin (2), Cuvier's beaked whale (1), sperm whale (3), humpback whale (1) and rough-toothed dolphin (1) (NOAA Fisheries, 2012).

**Table 9. Marine Mammal Species that May Occur in the Project Area.**

| Common Name | Scientific Name | Occurrence |
|---|---|---|
| North Atlantic right whale | *Eubalaena glacialis* | Uncommon |
| Humpback whale | *Megaptera novaeangliae* | Rare |
| Fin whale | *Balaenoptera physalus* | Rare |
| Sei whale | *Balaenoptera borealis* | Rare |
| Blue whale | *Balaenoptera musculus* | Unknown |
| Bryde's whale | *Balaenoptera brydei* | Rare |
| Sperm whale | *Physeter macrocephalus* | Rare |
| Atlantic spotted dolphin | *Stenella frontalis* | Rare |
| Bottlenose dolphin | *Tursiops truncatus* | Common |
| Minke whale | *Balaenoptera acutorostrata* | Rare |
| Pygmy sperm whale | *Kogia breviceps* | Uncommon |
| Dwarf sperm whale | *Kogia simus* | Rare |
| Short-finned pilot whale | *Globicephala macrorhynchus* | Uncommon |
| False killer whale | *Pseudorca crassidens* | Rare |
| Gervais' beaked whale | *Mesoplodon europaeus* | Rare |
| True's beaked whale | *Mesoplodon mirus* | Rare |
| Blainville's beaked whale | *Mesoplodpon densirostris* | Rare |
| Cuvier's beaked whale | *Ziphius cavirostris* | Rare |
| Rough-toothed dolphin | *Steno bredanensis* | Rare |
| Pantropical spotted dolphin | *Stenella attenuata* | Rare |
| Atlantic spotted dolphin | *Stenella frontalis* | Rare |
| Spinner dolphin | *Stenella longirostris* | Rare |
| Striped dolphin | *Stenella coeruleoalba* | Rare |
| Killer whale | *Orcinus orca* | Rare |
| Pygmy killer whale | *Freesa attenuata* | Uncommon |
| Risso's dolphin | *Grampus griseus* | Rare |
| Harbor seal | *Phoca vitulina* | Rare |
| Hooded seal | *Cystophora cristata* | Rare |

Bottlenose dolphins are common in the coastal marine areas along the Atlantic Coast south of Long Island and around the Florida peninsula (Waring *et al*. 2006). In 2009, the Western North (W.N.) Atlantic Coastal bottlenose dolphin stock was split into multiple stocks, including the

Western North Atlantic Central Florida Coastal Stock. The Central Florida Coastal stock is present in coastal Atlantic waters from 29.4°N south to the western end of Vaca Key (about 24.69°N – 81.11°W) where the stock boundary for the Florida Keys stock begins (NOAA Fisheries 2010). There is no obvious boundary defining the offshore extent of this stock. In waters less than 10 m depth, 70 percent of the bottlenose dolphins were of the coastal morphotype. Between 10 and 20 m depth, the percentage of animals of the coastal morphotype dropped, and at depths greater than 40 m, nearly all (over 90 percent) were of the offshore morphotype. These spatial patterns may not apply in the Central Florida Coastal stock, as there is a significant change in the bathymetric slope and a close approach of the Florida Current/Gulf Stream to the shoreline south of Cape Canaveral. The best estimate for the Central Florida Coastal stock is 6,318 and the resulting minimum population estimate is 5,094 (NOAA Fisheries 2010). The offshore form is distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic Ocean; however the offshore morphotype has been documented to occur relatively close to shore over the continental shelf south of Cape Hatteras, NC. The minimum population estimate for western North Atlantic offshore bottlenose dolphin is 70,775 (Waring et al. 2011).

There are two species of spotted dolphin in the Atlantic Ocean, the Atlantic spotted dolphin (*Stenella frontalis),* formerly *S. plagiodon*, and the pantropical spotted dolphin (*S. attenuate)*. The Atlantic spotted dolphin is distributed from southern New England, south through the Gulf of Mexico and the Caribbean to Venezuela (Waring *et al*. 2005). Although considered rare in waters off southeast Florida, they have been observed off Miami and Pompano Beach and would likely occur in the area (ASM 2007; NOAA 2005). Atlantic spotted dolphins are generally found over the continental shelf, but they can inhabit deep oceanic waters (OBIS SEAMAP 2007). The Atlantic spotted dolphin occurs in two forms which may be distinct sub-species: the large, heavily spotted form which inhabits the continental shelf and is usually found inside or near the 200 m isobath; and the smaller, less spotted island and offshore form which occurs in the Atlantic Ocean but is not known from the Gulf of Mexico (NOAA Fisheries 2007a). Where they co-occur, the offshore form of the Atlantic spotted dolphin and the pantropical spotted dolphin can be difficult to differentiate (NOAA Fisheries 2007a).

The western North Atlantic population is genetically separate and is provisionally being considered a separate stock from the Gulf of Mexico stock(s) for management purposes (NOAA Fisheries 2007a). Western North Atlantic dolphins may be genetically separated into two stocks around Cape Hatteras, NC, but these are not currently recognized as distinct management units. The best abundance estimate of Atlantic spotted dolphins is 50,978 (NOAA Fisheries 2007a). The minimum population estimates based on the combined abundance estimates is 36,235. The best recent abundance estimate for pantropical spotted dolphins is 4,439 (NOAA Fisheries 2007b).

### 3.5.4 Aquatic Resources

#### *3.5.4.1 Benthos*

Benthic organisms are important components of the habitat and provide an important food source for many species. Temporal and spatial variations in benthic communities affect the distribution and abundance of bottom-feeding fish. The abundance and species composition of benthic communities are affected by environmental factors, including temperature, sediment type, and the availability of organic matter (Stevenson *et al.* 2004).

The infaunal community in the ODMDS expansion area is complex and diverse (ANAMAR 2012). At least 141 taxa were identified in the Site Designation Study (ANAMAR 2012); approximately 75.5 percent of the total species were annelid worms. Tubificid oligochaete worms, polychaetes (*Prionospio* sp., *Levinsenia reducta*, *Cirrophorus* (= *Paradoneis*) *lyra*, and *Spiophanes kroeyeri),* bivalve mollusks (*Nuculana carpenteri*, *Cardiomya costellata)* and Philomedid Ostracod crustaceans were abundant. Pyramidellid gastropods, Esea cucumbers *(Leptosynapta* sp.), acorn worms (*Balanoglossus* sp.), ribbon worms (nemerteans), sea anemones (actiniaria), horseshoe worms (*Phoronis* sp.), and turbellarian flatworms (platyhelminthes) were less abundant (ANAMAR 2012).

Previous surveys of benthic infauna in the area were conducted in November 1984 (Barry A. Vittor & Associates, Inc., 1985) as well as in May and August 1998 (USEPA 1999). Analyzes of these surveys was included in Section 3.5.4 of the FEIS for site designation and is incorporated by reference.

#### *3.5.4.2 Plankton*

There are three main groups of plankton: bacterioplankton, phytoplankton, and zooplankton (Knox 2001). Plankton communities have important roles in marine waters. Bacterioplankton are primarily decomposers. Phytoplankton are the primary producers of the water column, and form the base of the estuarine food web. Zooplankton are faunal components of the plankton. A detailed discussion concerning plankton is included in Section 3.5.1 of the FEIS for site designation and is incorporated by reference.

The total zooplankton volume in an area near the Port Everglades ODMDS expansion area for the Calypso LNG Deepwater Port project area ranged from 0.12 to 1.73 ml/m3, with an average of 0.70 ml/$m^3$ (USCG 2008). The most abundant zooplankton taxa encountered in the USCG (2008b) study are presented in Table 10.

**Table 10. Zooplankton Taxa and Densities Represented in the Calypso LNG Deepwater Port Project Area during Two Sampling Events.**

| Taxa | | Density (number/m$^3$) | | |
|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **February** | **March** | **Average** |
| Calanoida | Copepods | 0.55 | 2.38 | 1.47 |
| Sagittoidea | Chaetognaths (Arrow worms) | 0.28 | 0.86 | 0.57 |
| Pleocyemata | Crabs, lobsters | 0.49 | 0.47 | 0.48 |
| Other Maxillopoda | Ostracods, copepods, barnacles | 0.11 | 0.83 | 0.47 |
| Dendrobrachiata | Prawns, shrimp | 0.37 | 0.28 | 0.33 |
| Hyperiidea | Hyperiidean amphipods | 0.00 | 0.61 | 0.30 |
| Sergestoidea | Prawns | 0.23 | 0.30 | 0.27 |
| Euphausiacea | Krill | 0.27 | 0.11 | 0.19 |
| Mysida | Opossum shrimp | 0.11 | 0.06 | 0.09 |
| Hydrozoa | Hydroids | 0.00 | 0.13 | 0.06 |
| Notes:<br>a. Density values presented represent the average of all bongo net samples (all mesh sizes, all depths, all stations).<br>b. Values are considered to be the minimum densities as not all non-target taxa were counted.<br>c. Density values presented represent the average of all life stages encountered (i.e., nauplii, megalopa, phyllosoma, and juveniles). | | | | |

**Source: USCG 2008**

Ichthyoplankton are the planktonic stages (eggs and larvae) of fish with limited or no ability to swim that is dispersed mainly transported by currents. Eggs and/or larval stages of most estuarine and marine fishes, with benthic or pelagic adults, are part of the planktonic community (Leiby 1984).

Currents provide a transport mechanism to move fish eggs and larvae to or from areas conducive to survival and directly influence recruitment and subsequent year-class success (Norcross and Shaw 1984). Many organisms spawn near circular currents (gyres), upwelling, or other directional circulations that frequently are associated with major current systems.

The Florida Current/Gulf Stream, near the proposed ODMDS expansion area, is the beginning of the Florida Current/Gulf Stream and stretches from the Florida Straits to Cape Hatteras in North Carolina (Gyory *et al.* 2005). The Florida Current/Gulf Stream provides a mechanism to disperse larvae and is considered EFH for various species of managed fish. Eggs and larvae spawned within the productive Florida Straits would be transported north through the project area by currents. The intensity and magnitude, and the distance from shore, of the Florida Current front are highly variable. Eddies associated with the frontal edge can have the potential to transport eggs and larvae offshore; however, ichthyoplankton are generally retained in nearshore waters because the strength of the Florida Current prevents their mixing into the northbound Florida Current water (USCG 2006). The average egg density in samples collected near the ODMDS was 1,069 eggs/million gallons (0.0011 eggs per gallon or 28 per 100 $m^3$) (USCG 2006). The average larval density was 1,102 larvae/million gallons (0.0011 larvae per gallon or 29 per 100 $m^3$), representing at least 33 (identified) taxa (USCG 2006).

### 3.5.5 Fisheries Resources

Federally managed species and non-managed species are found in the proposed ODMDS expansion area. This section describes general finfish and shellfish resources in the Project area, as well as species observed in the area.

#### *3.5.5.1 Finfish*

Finfish species that could potentially occur in the proposed ODMDS expansion area can be categorized as reef, demersal, coastal pelagic, oceanic pelagic, or mesopelagic species, depending on habitat utilization. The Florida Current/Gulf Stream and associated eddies provide valuable fish habitat. Species and life-stage-specific patterns vary between the inshore and offshore Florida Current/Gulf Stream fronts. Anchovies and mackerels use inshore fronts, whereas dolphin and swordfish utilize offshore fronts (SAFMC 2002). Most swordfish were reported along the oceanic front between nearshore waters and the Florida Current/Gulf Stream, which may meander as close as five miles offshore.

In April 2006, a benthic video survey was conducted near the ODMDS expansion area for the Calypso LNG Deepwater Port project area to evaluate the habitat present (Figure 14) (Messing et al. 2006). Although the purpose of this study was not to identify local fish species, at least 16 species were observed during the course of the survey.

**Table 11. Fish Species Identified during Calypso Pipeline Survey (Source:Messing et al. 2006)**

| Common Name | Species or Taxa | Common Name | Species |
|---|---|---|---|
| Blind torpedo | *Benthobatis marcida* | Gulf Stream flounder | *Citharichthys arctifrons* |
| Shortnose greeneye | *Chlorophthalmus agassizi* | Greatnorthern tilefish | *Lopholatilus chamaeleonticeps* |
| Armored searobin | *Peristedion sp.* | Spiny eel | *Notcanthidae* |
| Blueline tilefish | *Caulolatius microps* | Tripod fish | *Bathypterois sp.* |
| Frogmouth (gaper) | *Chaunax pictus* | Rattail | *Nezumai sp.* |
| Blackbelly rosefish | *Helicolenus dactylopterus* | Blacktail codling | *Laemonema melanurum* |
| Unknown skate | *Rajidae* | Catshark | *Scyliorhinidae* |
| Unidentified eels | *Synaphobranchidae* | Rattail | *Coelorhynchus sp.* |
| Unidentified scorpionfishes | *Scorpaenidae* | | |

In May 2011, as part of the site designation survey, EPA conducted epibethic and infaunal surveys. Table 12 lists the finfish species collected during that survey. A total of 15 families (representing 10 orders) were collected in the trawl samples in the ODMDS expansion areas during the site designation study (Figure 23; ANAMAR 2012). Four species of Perciformes represented 22 percent of all fish species collected; however, the bar jack and the rainbow runner, are pelagic species. The most abundant fish species caught in trawls in the ODMDS expansion area during the site designation study was the Gulf Stream flounder (Citharicthys arctifrons). Other abundant species included the highfin scorpionfish (*Pontinus rathbuni*) and the fawn cusk-eel (*Lepophidum profundorum*) (ANAMAR 2012). The spotted hake may forage for benthic invertebrates and fishes in the area. The blind torpedoes and rosette skates captured during the trawl survey likely use the area for foraging. Many of the invertebrates and the fishes are potential prey for deepwater apex predators such as the sharpnose sevengill shark (*Heptranchias perlo*) and bluntnose sixgill shark *(Hexanchus griseus)* (ANAMAR 2012).

Although not captured during the EPA site designation surveys, blueline tilefish were documented within the upper northeast corner of the proposed ODMDS expansion area near a modern sailboat shipwreck during a remotely operated vehicle (ROV) (NOAA Fisheries, 2011).

**Table 12. Fish Species Observed during Trawling**

| Common Name | Species or Taxa | Common Name | Species |
|---|---|---|---|
| Rosette skate | *Leucoraja garmani* | Fourspot flounder | *Paralichthys oblongus* |
| Blind torpedo | *Benthobatis marcida* | Deepwater flounder | *Monolene sessilicauda* |
| Argentine | *Argentina georgei* | Highfin scorpionfish | *Pontinus rathbuni* |
| Shortnose greeneye | *Chlorophthalmus agassizi* | Rimspine searobin | *Peristedion thompsoni* |
| Shortbeard codling | *Laemonema barbatulum* | Blackmouth bass | *Synagrops bellus* |
| Metallic codling | *Physiculus fulvus* | Bar jack | *Caranx ruber* |
| Spotted hake | *Urophycis regia* | Rainbow runner | *Elagatis bipinnulata* |
| Fawn cusk-eel | *Lepophidium profundorum* | Spotfin dragonet | *Foetorepus agassizii* |
| Blackfin goosefish | *Lophius gastrophysus* | Gulf Stream flounder | *Citharichthys arctifrons* |

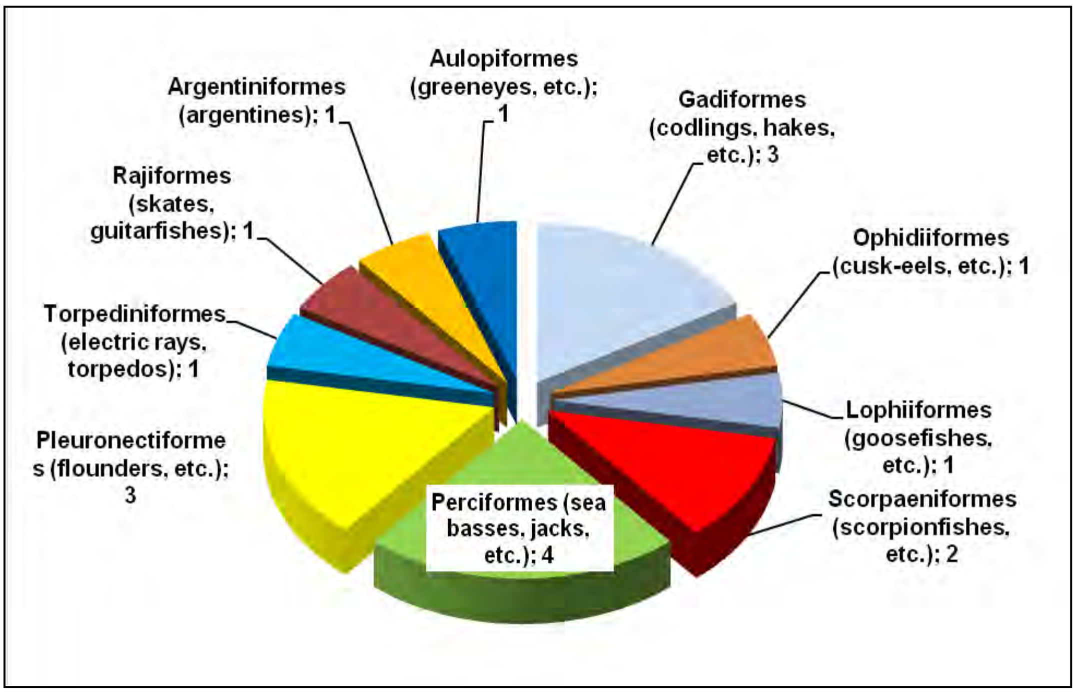


**Figure 23. Eighteen trawled fish species, by order, collected in epifaunal trawl samples Source: USACE 2011.**

### *3.5.5.2 Epifauna*

Epifaunal taxa collected in trawls during the site designation study were primarily fishes and arthropods (Figure 24). The highest total epifaunal density (87.79 individuals per 1,000 $m^3$) was observed west of the ODMDS expansion area during the site designation study (Table 13) (ANAMAR 2012).

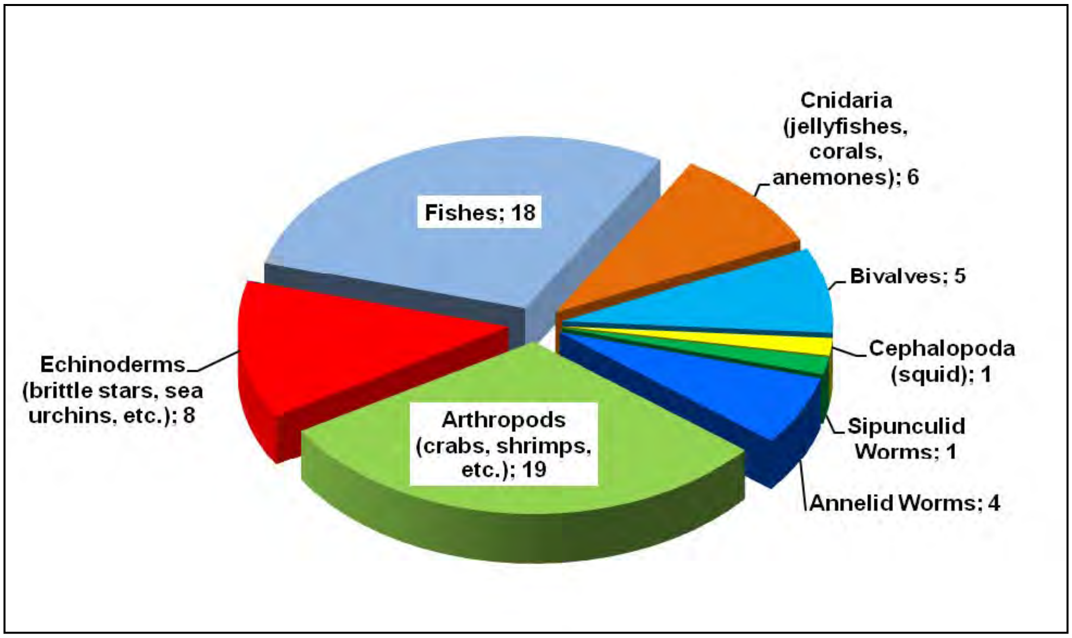


**Figure 24. Sixty-two trawled epifaunal taxa by major taxonomic group (includes all epifaunal trawl samples) (source ANAMAR 2012).**

**Table 13. Total Epifaunal Density per Station, by Rank.**

| Total Epifaunal Density per Station, by Rank | | |
|---|---|---|
| **Station Number** | **Relationship to Expansion Areas** | **Total Epifaunal Density (individuals/1,000 $m^3$)** |
| PE11-9 | Outside (west of) Expansion Areas | 87.79 |
| PE11-6 | Inside Expansion Areas | 57.86 |
| PE11-8 | Outside (south of) Expansion Areas | 31.27 |
| PE11-7 | Inside Expansion Areas | 30.47 |

**Source: ANAMAR 2012**

#### *3.5.5.3 Shellfish*

The commercially important species potentially occurring in the proposed ODMDS expansion area generally prefer soft bottom habitat. They include one shrimp species (royal red shrimp) and the golden crab. Several squid and octopus species are found at depths similar to that of the proposed ODMDS expansion area (Carpenter 2002). In addition, 20 species of brachyuran crabs are known from depths greater than 656 ft (200 m) on the continental slope and margin of the northern Florida Straits (Soto 1985). The golden crab is found along a variety of soft substrate in water depths ranging from 675 to 3,300 ft (205.7 to 1005.8 m) (NOAA Fisheries 2007c). Deepwater shrimp, such as the royal red shrimp and the seabob shrimp (Xiphopenaeus kroyeri) are found in the south Atlantic at depths up to 1,500 ft (457 m) (SAFMC 1998). Royal red shrimp occur over mud, sand, muddy sand, and white calcareous mud, typically in depths between 820 and 1,558 ft (18.3 to 474.9 m) (NOAA Fisheries 2007d). The rock shrimp occurs in water deeper than 600 ft (182.9 m), but prefer sandy bottoms in depths between 60 and 240 ft (18.3 and 73.1 m) (Hill 2005).

Various other species of shellfish were observed during benthic surveys in the area during the site designation study, including the lesser bobtail squid (*Semirrosia tenera*), the bathyal swimming crab (*Bathynectes longispina*), the inflated spiny crab (*Rochinia crassa*), a deepwater crab (*Eumunida picta*), the Jonah crab (*Cancer borealis*), a symmetrical hermit crab (Family Pylochelidae), a right-handed hermit crab (Family Paguridae), and an unidentified shrimp (ANAMAR 2012).

#### *3.5.5.4 Invasive Species*

Invasive marine species can be introduced in various ways. A primary vector for the introduction of invasive species in the marine environment is ballast water from foreign vessels (USCG 2007). Individual organisms become entrained in the ballast tanks of vessels when filled and are introduced into a system when the vessel de-ballasts in foreign waters (IMO 2007). The exterior of vessels, such as hulls or propellers, are also potential vectors whereby fouling organisms, such as mollusks, often find suitable substrate for colonization and subsequent transport to alien ecosystems (Holdgate 1986). Many marine fish introductions result from intentional stocking for fishery purposes. Other fish species, such as the lionfish, were likely introduced by unintentional or intentional aquarium releases (Hare and Whitfield 2003; Semmens *et al.* 2004). The invasive dynamic follows a three-tiered progression from transport, to invasion, to establishment/spreading (Holdgate 1986).

No invasive species were reported during sampling in the ODMDS expansion areas for the site designation study (ANAMAR 2012). Invasive species that have been observed in the Atlantic Ocean off Broward County include a coral species with an established population, the orange cup coral *(Tubastrea coccinea)*, and a single specimen of the crustacean Asian tiger shrimp *(Penaeus monodon)* (USGS 2011). Invasive fish species with established populations in the vicinity of the proposed ODMDS expansion area include the venomous lionfish (*Pterois* volitans/miles complex), fairy basslet (Gramma loreto), and tessellated blenny (Hypsoblennius invemar) (USGS 2011; Hare and Whitfield 2003; Semmens et al. 2004). Small numbers of the following species have been collected in the area: sohal surgeonfish (Acanthurus sohal), sailfin tang (Zebrasoma desjardinii), yellow tang (Z. flavescens), brown tang (Z. scopas), orbiculate batfish (Platax orbicularis), blue ringed angelfish (Pomacanthus annularis), Arabian angelfish (P. asfur), emperor angelfish (P. imperator), yellowbar angelfish (P. maculosus), semicircle angelfish (P. semicirculatus), bluefaced angelfish (P. xanthometapon), peacock hind (Cephalopholis argus), and panther grouper (Chromileptes altivelis) (USGS 2011; Semmens et al. 2004).

## 3.6 ESSENTIAL FISH HABITAT

The Port Everglades Harbor ODMDS expansion areas fall under the jurisdiction of the South Atlantic Fishery Management Council (SAFMC). The SAFMC has identified and described EFH for hundreds of marine species covered by eight Fishery Management Plans (FMPs). In addition, the NOAA Fisheries has prepared a FMP for Highly Migratory Species (tunas, billfishes, sharks, and swordfish) which includes associated EFH. A list of species managed by the SAFMC and South Atlantic species managed under Federally-Implemented Fishery Management Plans that could potentially be affected by the project is provided in Table 14. An EFH Assessment is included as Appendix C, and the EFH Assessment for the designation of the original ODMDS is found in Appendix I of the FEIS.

The categories of EFH for managed species which could potentially be found in the ODMDS expansion area are: artificial/manmade reefs; coral and coral reefs, live/hard bottoms, *Sargassum*; and water column. The Habitat Areas of Particular Concern (HAPCs) for managed species which may be found in the ODMDS include: Hermatypic (reef-forming) coral habitat and reefs, hard bottom, and *Sargassum* habitat. Maps of all EFH boundaries are available on the National Oceanic and Atmospheric Administration's website through the use of the EFH Mapper, found at http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html.

According to a letter from NOAA Fisheries "Deepwater hard and soft bottom habitats within, and in close proximity, to the ODMDS expansion area are designated EFH for species managed under the Snapper-Grouper, Golden Crab, and Shrimp Fisheries" (NOAA Fisheries, 2011). In addition, species from the Highly Migratory Pelagic Fisheries may be present in the area (Table 14).

Areas which meet the criteria for HAPCs for coral, coral reefs, and live/hard bottom in east Florida include the *Phragmatopoma* (worm reefs) reefs off the central east coast of Florida; nearshore (0-4 meters; 0-12 feet) hard bottom off the east coast of Florida from Cape Canaveral to Broward County); and offshore (5-30 meter; 15-90 feet) hard bottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida (SAFMC 1998).

The Stetson-Miami Terrace HAPC was established by the SAFMC in 2009 and is the largest deepwater coral HAPC off the coast of east Florida; this HAPC follows the1,312 ft (400m) depth contour and covers a large area north to south (22,876 square miles) extends to the 1,312 ft (400 m) depth contour (Figure 24 (SAFMC/ NOAA Fisheries 2009)). The Miami Terrace is a 40-mile-long carbonate platform between Boca Raton and South Miami in depths of 656 to 1,312 ft (200 to 400 m) (Reed *et al.* 2006). The Miami Terrace provides high-relief rocky habitat for rich communities of benthic invertebrates and fishes, as well as various species of coral. This HAPC is located approximately 0.5 nmi east of the southeastern corner of the proposed ODMDS expansion area. The expanded ODMDS overlays the SE corner of the existing ODMDS, thus no there is no change to the existing condition.

The Florida Current/Gulf Stream and associated eddies provide valuable fish habitat. Species and life-stage-specific patterns vary between the inshore and offshore Florida Current/Gulf Stream fronts. Anchovies and mackerels use inshore fronts, whereas dolphin and swordfish utilize offshore fronts (SAFMC 2002). Most swordfish were reported along the oceanic front between nearshore waters and the Florida Current/Gulf Stream, which may meander as close as five miles offshore.

**Table 14. EFH Species for Marine Waters Managed by the South Atlantic Fishery Management Council and within the Atlantic Highly Migratory Species (HMS) Fishery Management Plan with Potential for EFH within the ODMDS Expansion Area**

| Species | Scientific Name | Life stage Ecotype | EFH Description |
|---|---|---|---|
| **Shrimp Fishery Management Plan** | | | |
| Royal Red Shrimp | *Pleoticus robustus* | adults | Upper regions continental slope 180-730m, mud/sand substrate; Florida Current/Gulf Stream |
| **Snapper-Grouper Fishery Management Plan (representative species)** | | | |
| Snowy grouper | *Epinephelus niveatus* | eggs/larvae adults | Coral reefs, live/hard bottom, submerged aquatic vegetation, artificial reefs and medium to high profile outcroppings on and around the shelf break zone from shore to at least 182.8 m where the annual water temperature range is sufficiently warm to maintain adult populations. Water column above adult habitat and pelagic environment, including *Sargassum*, Florida Current/Gulf Stream |
| Yellowedge grouper | *Epinephelus flavolimbatus* | eggs/larvae adults | |
| Warsaw grouper | *Epinephelus nigritus* | eggs adults | |
| Speckled hind | *Epinephelus drummondhayi* | adults | |
| Wreckfish | *Polyprion americanus* | adults | Above description to at least 609 m |
| Vermilion snapper | *Rhomboplites aurorubens.* | juvenile adults | Coral reefs, live/hard bottom, submerged aquatic vegetation, artificial reefs and medium to high profile outcroppings on and around the shelf break zone from shore to at least 182.8 m where the annual water temperature range is sufficiently warm to maintain adult populations. Water column above adult habitat and pelagic environment, including *Sargassum*, Florida Current/Gulf Stream |
| Blackfin snapper | *Lutjanus buccanella* | adults | |
| Silk snapper | *Lutjanus peru* | juvenile adults | |
| Greater amberjack | *Seriola dumerili* | juvenile adults | |
| Blueline tilefish | *Caulolatilus bermudensis* | eggs adults | |
| Golden tilefish | *Lopholatilus chamaeleonticeps* | adults | |
| **Golden Crab Fishery Management Plan** | | | |
| Golden crab | *Chaceon fenneri* | adults | Continental shelf; foraminiferan ooze, dead coral mounds, ripple habitat, dunes, black pebble habitat, low outcrop, soft-bioturbated habitat 320-567 m, Florida Current/Gulf Stream |
| | | | |

| | | | |
|---|---|---|---|
| **Coral, Coral Reef, and Live/Hardbottom Habitat Fishery Management Plan** | | | |
| Coral | | all stages | Ahermatypic stony corals, extends to outer shelf depths. For *Antipatharia* (black corals) includes rough, hard, exposed, stable<br><br>substrate, offshore in high salinity waters in depths exceeding 18 m, not restricted by light penetration on the outer shelf; octocorals except the order Pennatulacea (sea pens and sea pansies) includes rough, hard, exposed, stable substrate in subtidal to outer shelf depths; Pennatulacea includes muddy, silty bottoms in subtidal to outer shelf depths |
| **Highly Migratory Species Fishery Management Plan** | | | |
| Atlantic bluefin tuna | *Thunnus thynnus* | eggs/larvae | Florida Straits north to waters off South Carolina |
| Atlantic skipjack tuna | *Katsuwonus pelamis* | eggs/larvae<br><br>juvenile to adult | Portions of the Florida Straits; continuous EFH from the southern east coast of Florida through the Florida Keys. |
| Atlantic yellowfin tuna | *Thunnus albacares* | eggs/larvae | Portions of the Florida Straits |
| Swordfish | *Xiphias gladius* | eggs/larvae<br><br>juvenile to subadult<br><br>adult | From NC extending south around peninsular Florida through the Gulf from the 200 m isobath to the EEZ boundary; associated with the western edge of the Florida Current/Gulf Stream |
| Blue marlin | *Makaira nigricans* | eggs/larvae<br><br>juvenile<br><br>adult | Off Florida; Florida Keys to southern Cape Cod |
| White marlin | *Tetrapturus albidus* | juvenile | Florida Keys to mid-east coast of |

| | | | |
|---|---|---|---|
| | | adult | Florida |
| Sailfish | *Istiophorus platypterus* | eggs/larvae<br>juvenile<br>adult | Florida Straits from 5 mi offshore out to the EEZ boundary; Atlantic east coast from the Florida Keys to past north Florida |
| Longbill spearfish | *Tetrapturus pfluegeri* | juvenile<br>adults | Florida Keys to the mid-east coast of Florida |
| Bignose shark | *Carcharhinus altimus* | juvenile<br>adult | East coast of Florida |
| Caribbean reef shark | *Carcharhinus perezi* | all stages | Atlantic coastal areas from the southern to mid-Florida coast |
| Night shark | *Carcharhinus signatus* | all stages | Southern and mid-east coast of Florida |
| Silky shark | *Carcharhinus falciformis* | all stages | Atlantic east coast from Florida to NJ |
| Longfin mako shark | *Isurus paucus* | all stages | Atlantic from southern Florida through SC |
| Blue shark | *Prionace glauca* | adult | Atlantic off Florida |
| Oceanic whitetip shark | *Carcharhinus longimanus* | all stages | Atlantic from southern Florida to southern New England |
| Bigeye thresher shark | *Alopias superciliosus* | all stages | Atlantic east coast from southern to the mid-Florida coast |
| Great hammerhead shark | *Sphyrna mokarran* | all stages | Atlantic east coast from the Florida Keys to NJ |
| Nurse shark | *Ginglymostoma cirratum* | juvenile | Atlantic east coast of Florida |
| Blacktip shark | *Carcharhinus limbatus* | adult | In the Atlantic from the mid-east coast of Florida to the mid-coast of SC |
| Bull shark | *Carcharhinus leucas* | juvenile | East coast of Florida to SC in the Atlantic |

| | | | |
|---|---|---|---|
| | | adult | |
| Lemon shark | *Negaprion brevirostris* | juvenile | Atlantic east coast of Florida |
| Scalloped hammerhead shark | *Sphyrna lewini* | juvenile<br>adult | Atlantic east coast of Florida through NJ/NY |
| Dusky shark | *Carcharhinus obscurus* | neonate<br>juvenile<br>adults | Atlantic east coast of Florida |
| Spinner shark | *Carcharhinus brevipinna* | juvenile<br>adult | Atlantic east coast of Florida to GA |
| Tiger shark | *Galeocerdo cuvier* | juvenile | Atlantic east coast from Florida to New England |

## 3.7 COASTAL BARRIER RESOURCES

The proposed project involves only deep-water submerged habitat and the water column above it. Figure 25 lists the designated Coastal Barrier Resource Units in Broward County.

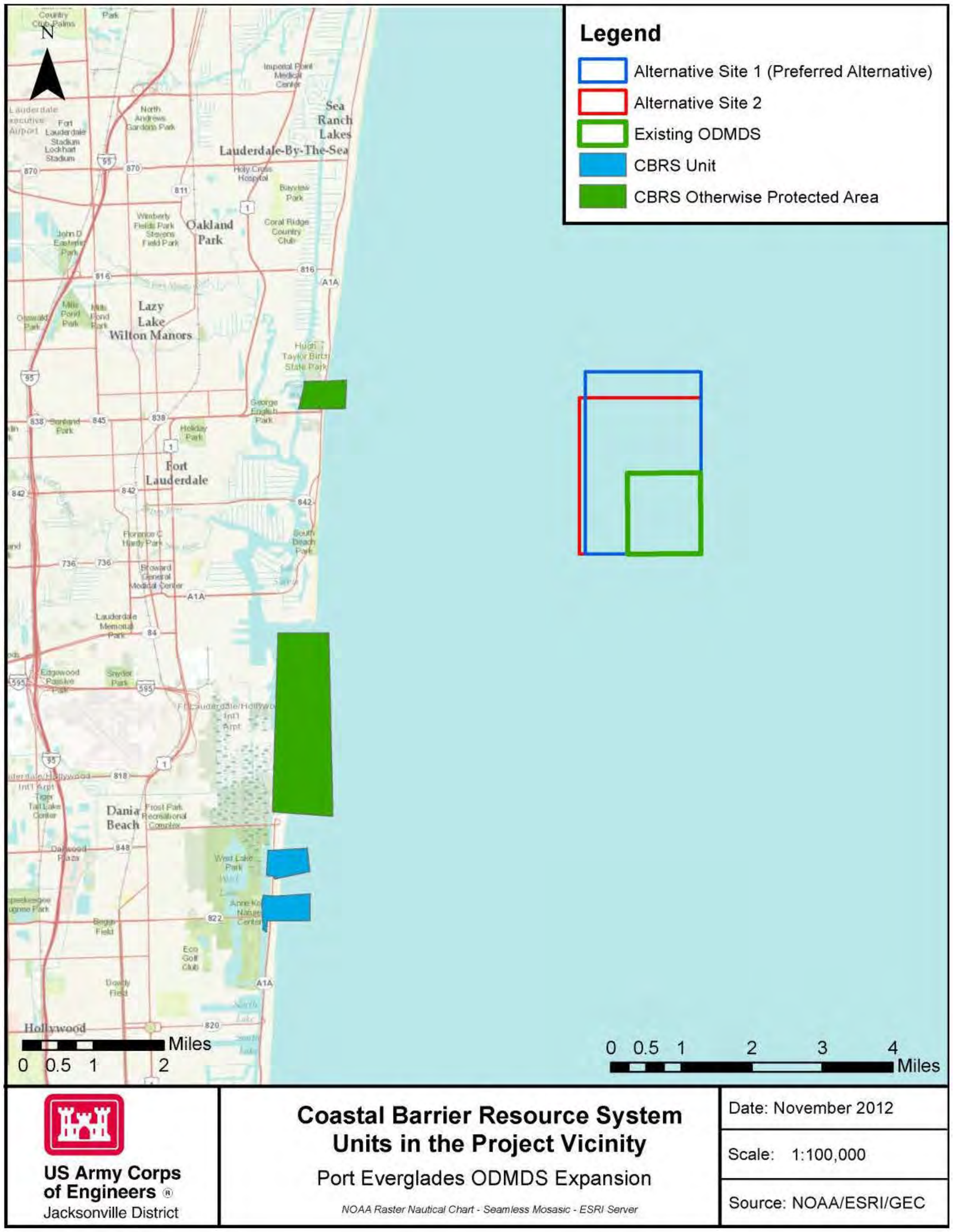


**Figure 25. CBRS units in the vicinity of the project area.**

## 3.8 WATER QUALITY

Section 3.8 of the 2004 EIS for designation of the Port Everglades ODMDS provides a detailed analysis about water quality in the vicinity of the ODMDS that is incorporated into this EA by reference. Water quality data collected since site designation is included below.

### 3.8.1 Salinity

Surface water salinity in the Atlantic Ocean ranges from approximately 34 to 37 parts per thousand (ppt). The subsurface core waters of the Florida Current are characterized by salinities of approximately 36.2 to 36.6 ppt (Suez 2006). Salinity recorded in the ODMDS expansion areas just north of the existing ODMDS during an October 2007 survey was nearly constant (35.9 to 36.6 ppt) with water depth (ANAMAR 2010) and during a May 2011 survey was also nearly constant (35.0 to 36.4 ppt) at both stations sampled (ANAMAR 2012).

### 3.8.2 Water Temperature

Water temperatures in the area tend to be warmer further offshore; this is attributed to the influence of the Florida Current. Water column profiles were examined in the ODMDS expansion areas just north of the existing ODMDS in October 2007 and May 2011. In October 2007, temperatures ranged from a high of 29$^{o}$C at the surface to a low of 15$^{o}$C near the bottom. A thermocline existed between 230 and 560 ft (70 and 170 meters) (ANAMAR 2010). Two water column profiles were examined during the site designation study in May 2011; results were similar (ANAMAR 2012). Water temperatures ranged from 8.1 near the seafloor to 26.7°C in an isothermic layer extending from the water's surface to about 70 ft (21.3 m) deep at both stations. The mean temperature change was about 0.4°C per 16 ft (4.9 m) of water depth at both stations. A thermocline of 1.0°C or more temperature decrease per 16 ft (4.9 m) was observed between about 180 and 280 ft (54.9 to 85.3 m) deep at both stations (ANAMAR 2012).

### 3.8.3 Dissolved Oxygen

Dissolved oxygen is an important indicator of water quality and is critical to ecosystem health. Dissolved oxygen concentrations of 5 parts per thousand or higher are considered optimal. Fish and other animals become stressed when the concentration of dissolved oxygen dips below 2 ppt. Dissolved oxygen concentrations can vary seasonally due to wind mixing and levels of primary productivity (algae growth). Dissolved oxygen levels in the ODMDS expansion areas just north of the existing ODMDS during the site designation study in May 2011 ranged from 6.6 mg/l to 7.3 mg/l in the surface waters extending to 180 ft (55m) below the surface. Below this surface layer, dissolved oxygen concentrations decreased steadily to 4.4 mg/l at 330 feet (100m) and remained relatively constant to the seafloor (ANAMAR 2012). In October 2007, remained consistently around 5.7 to 6.0 mg/l in the upper 330 feet (100m) then dropped to a range of 4.0 to 4.2 mg/l at depths of 460 ft (140m) and below (ANAMAR 2010).

### 3.8.4 Turbidity

Turbidity is a measure of water clarity and how much the material suspended in water decreases the passage of light through the water. Suspended materials include soil particles (clay, silt, and sand), algae, plankton, microbes, and other substances. High levels of turbidity and total suspended solids (TSS) can negatively affect water quality by reducing light penetration, limiting the ability of aquatic organisms to find food, degrading available habitat, and fouling the gills of fish and invertebrates. TSS levels in the existing ODMDS varied between 3 and 26 mg/L throughout the water column. Maximum TSS levels coincided with the depth of the thermocline, where particulates generally accumulate (USEPA 2004). Turbidity levels are consistently low with a majority of readings below 0.5 FTU (Formazin Turbidity Unit). TSS levels in the ODMDS expansion areas during the site designation study in May 2011 ranged from a low of 6.0 mg/L in 213 ft (64.9 m) of water within a thermocline to a high of 13.0 mg/L in 410 ft (125 m) of water within an isotherm (ANAMAR 2012). Measured TSS levels are presented in Table 15 (ANAMAR 2012).

The photic zone can be defined as greater than or equal to 2 percent of surface photosynthetically active radiation (PAR) values. The photic zone was found to be within approximately 200 ft (61 m) of the water's surface in the ODMDS expansion areas during the site designation study in May 2011 (ANAMAR 2012). Similarly, the photic zone was identified within the upper 180 ft (55m) in October 2007 (ANAMAR 2010).

**Table 15. Total Suspended Solids in the Water Column in the ODMDS Expansion Areas just Northwest (PE11-6) of the Existing ODMDS in May 2011**

| Position within Water Column | Depth of Sample (ft) | Depth of Sample (m) | Total Suspended Solids (mg/L) | Turbidity (FTU) |
|---|---|---|---|---|
| Near surface | 16.4 | 5.0 | 8.5 | 0.2 |
| Within thermocline | 213.2 | 65.0 | 6.0 | 0.3 |
| Within lower isotherm | 410.0 | 125.0 | 13.0 | 0.2 |
| Near bottom | 623.2 | 190.0 | 7.0 | 0.2 |

**Source: (ANAMAR 2012)**

### 3.8.5 Water Chemistry

Chemical analyses were performed on site water samples taken from the ODMDS proposed expansion area in 2007 (ANAMAR 2010). Water samples were collected at four depths; near the surface, above the thermocline, below the thermocline and near the bottom. Samples were analyzed for general chemistry parameters including ammonia, cyanide, nitrogen, phosphorus, and sulfate, as well as total organic carbon, metals, organochlorine pesticides, PAHs, pentachlorophenol, organic tins and PCBs. No organic tins or PCBs were detected in any of the water samples.  Only the pesticides beta-BHC, 4,4’DDT, and gamma-Chlordane were detected at quantifiable concentrations with 4,4’DDT exceeding federal water quality criteria (criteria continuous concentration [CCC]) in two samples at concentrations of 0.0017 to 0.0023 µg/l. Benzo(g,h,i) perylene, indeno (1,2,3-cd) pyrene and naphthalene were the only PAHs detected at quantifiable concentrations. These PAHS were at low levels below federal water quality criteria. No analytes were detected above the federal water quality criteria for the criteria maximum concentration [CMC]).  Water chemistry parameters are summarized in Table 14 below (ANAMAR 2010).

**Table 16. Quantifiable Analystes and General Chemistry Parameters in the Water Column in the ODMDS Expansion Areas in October 2007**

| Analyte | Maximum Detected Concentration | Federal Water Quality Criteria CCC[1]/CMC[2] |
|---|---|---|
| | µg/l | |
| Arsenic | 1.54 | 36/69 |
| Cadmium | 0.021 | 8.8/40 |
| Chromium | 0.18 | na |
| Copper | 0.18 | 3.1/4.8 |
| Lead | 0.027 | 8.1/210 |
| Mercury | <0.20 | 0.94/1.8 |
| Nickel | 0.28 | 8.2/74 |
| Selenium | <1.0 | 71/290 |
| Silver | <0.050 | na/1.0 |
| Zinc | 1.10 | 81/90 |
| Beta-BHC | 0.0022 | na |
| 4,4'DDT | 0.0023 | 0.001/0.13 |
| Gamma-Chlordane | 0.00041 | na |
| Benzo(g,h,i) perylene | 0.0032 | na |
| Indeno (1,2,3-cd) pyrene | 0.0029 | na |
| Naphthalene | 0.0035 | na |
| | mg/l | |
| Ammonia as Nitrogen | 0.08 | na |
| Cyanide, Total | 0.013 | na |
| Nitrate+Nitrite as Nitrogen | 0.21 | na |
| Total Kjedahl Nitrogen (TKN) | 1.1 | na |
| Orthophosphate as Phosphorus | 0.04 | na |
| Phosphorus, Total | 0.16 | na |
| Sulfate | 2790 | na |
| Sulfide, total | <0.05 | na |
| Total Organic Carbon | 1.4 | na |

Source: (ANAMAR 2010)

[1]CCC=Criteria Continuous Concentration

[2]CMC=Criterion Maximum Concentration

### 3.8.6 Human-Related Discharges

The western edge of proposed ODMDS expansion area Alternative 1 would be located approximately 3.5 nmi northeast from Port Everglades. Port Everglades is a busy commercial and recreational port adjacent to the Florida cities of Fort Lauderdale, Dania Beach, and Hollywood, with 4,183 ship calls for the 2011-2012 fiscal year (Port Everglades 2012). Port Everglades is one of the largest cruise ship ports in the United States. In Fiscal Year 2011, which ended September 30, 2011, the port logged a record 3.66 million multi-day cruise passengers (Port Everglades 2011).

Potential sources of human-related discharges in the Port Everglades area include vessels specifically cruise ships, and ocean outfalls. A single cruise ship with 3,000 passengers can generate 25,000 gallons of raw sewage and 143,000 gallons of sanitary wastewater every day (Oceana 2007). Ships can discharge raw sewage to the ocean once they are at least 3 miles from the coastline. The impact of this discharge to water quality in the vicinity of the ODMDS expansion area depends on the current regime at any given time. The seabuoy for Port Everglades is approximately two miles southwest of the existing ODMDS. Vessels frequent the area directly south of the proposed expansion area and could therefore affect water quality in the vicinity (BOEM 2012).

Broward County currently has two ocean outfalls which discharge partially treated municipal wastewater directly into the ocean. In 2008, the state of Florida signed legislation that prohibits the construction of any new ocean outfall pipes in Florida, eliminates the six (now five) ocean outfall pipes in Palm Beach, Dade, and Broward Counties, requires these counties meet advanced wastewater treatment guidelines by 2018, and prohibits ocean discharge after 2025. Both outfalls are located more than 10 nmi from the proposed expansion area and therefore are not expected to affect the area (EPA 2004).

## 3.9 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE

Hazardous, toxic or radioactive materials cannot be disposed of in the ODMDS. Surveys of the proposed ODMDS did not indicate the presence of any hazardous, toxic or radioactive waste in the proposed expansion area (ANAMAR 2012).

## 3.10 AIR QUALITY

The USEPA, in accordance with the Clean Air Act, set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Clean Air Act identified two types of NAAQS. Primary standards set limits to protect public health, including the health of *sensitive* populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Broward County is currently in attainment for all criteria pollutants. Air quality in the proposed ODMDS expansion area is good due to either onshore or offshore breezes. The USEPA has authority over OCS sources in the area. Under the USEPA rules, OCS sources within 25 miles of the state's boundaries are subject to the same Federal and state requirements that would apply if the source were located onshore. The air over the OCS water is not classified, but it is presumed to be better than the NAAQS for all criteria pollutants. Air quality in adjacent onshore areas may be affected by releases of air pollutants from OCS sources.

## 3.11 NOISE

Section 3.11 of the designation FEIS is incorporated by reference. Ambient noise levels offshore are generally low. Noise in this area is limited to that of the vessels passing through the area. Recreational boaters contribute minimally to the amount of noise in the area. Noise levels fluctuate during the year, the highest levels usually occur during the spring and summer months due to increased coastal activities. The proposed ODMDS expansion area does not encompass any noise-sensitive institutions, structures or facilities.

## 3.12 RECREATION RESOURCES

Recreational resources are natural or man-made lands or waters designated or managed by local, state, or Federal agencies for leisure use by visitors and local residents. Offshore recreational resources include recreational fishing, sailing, and boating areas, diving areas, and other water sport areas. Section 3.13 of the 2004 designation FEIS provides a detailed analysis on recreational resources and is incorporated by reference.

## 3.13 NAVIGATION AND PUBLIC SAFETY

Marine transportation includes all vessels that access the ocean via channels or navigable waterways. In the waters off of Broward County, marine vessels currently participate in a variety of activities, including commercial, recreational, Federal, and state operations. There are two primary traffic routes offshore Port Everglades, an inshore north-south route and an offshore north-south route. The inshore route is located approximately 6 to 8 nmi offshore and east of the proposed ODMDS expansion area (FAU 2012). Additionally, in 2009 Bureau of Ocean Energy Management (BOEM) analyzed US Coast Guard Automated Identification System (AIS) data to determine levels of vessel traffic offshore Port Everglades (BOEM 2012). The proposed ODMDS expansion area is located in an area of relatively low vessel activity.

## 3.14 HISTORIC AND CULTURAL RESOURCES

The earliest widely accepted date of occupation by aboriginal inhabitants of Florida dates from around 12,000 years ago (Milanich 1994). This earliest cultural period, called the Paleo-Indian period, lasted until about 10,000 YBP (years before present). Sea level was lower and the continental shelves were exposed - an area almost twice the width of the current size of the state. Few Paleo-Indian archeological sites are recorded in south Florida.

During the Archaic period (ca. 10,000 YBP - ca. 2500 YBP), a wider range of resources was exploited and may have led to a more sedentary existence. Sea level rose to its present position. Few Archaic period archeological sites are recorded in south Florida. Known sites are clustered along the Atlantic coast and inland waterways.

Two, different regional cultural traditions within Broward County, known as the Glades and the Okeechobee cultures, developed from the Archaic period in south Florida around 2500 YBP. Occurring within the eastern part of the county, the Glades culture sequence (ca. 2500 YBP-A.D. 1513) produced a large number of sites, predominantly along the coasts, but also on tree islands in the interior wetlands. Glades site types include shell and earth middens and low sand mounds.

During the early historic period, beginning with the first Spanish colonial period (A.D. 1513-1763), the Ais, Tequesta, and Calusa were the main tribal groups that controlled southern Florida. Other native tribes, the Jeaga and Hobe, inhabited the Atlantic coast, as well. Their population was decimated by European-introduced diseases, warfare, enslavement, and migration out of Florida.

The Miccosukee and the Seminole migrated into Florida in the 18$^{th}$ and 19$^{th}$ centuries from Georgia and Alabama. Throughout the mid 1800s, the U.S. relentlessly pursued a policy of Indian removal in Florida. The Seminole Indian Wars (1835-1842) were the result. The Seminole and Miccosukee, resisting removal, eventually established themselves in the Everglades, Big Cypress Swamp and the Ten Thousand Islands.

American settlement in south Florida began in earnest in the late 19$^{th}$ century after Florida became a U.S. Territory in 1821. Initially, Fort Lauderdale was known as the New River Settlement. In response to the Second Seminole War, a fort (Fort Lauderdale) was constructed in 1838 and was abandoned after the war in 1842.

During 1875-1876, the U.S. Life-Saving Service, one of the forerunners to the U.S. Coast Guard, established a series of Houses of Refuge and Life Saving Stations along Florida's eastern coast to offer relief and assistance to shipwreck survivors (PCI 2011). One of the first of these was located at the beach site of old Fort Lauderdale.

The Florida East Coast Railroad and the Florida Land Boom of the 1920s brought new settlers and tourists to Broward Beach Counties and Fort Lauderdale grew quickly. Land and agriculture were the economic backbone of south Florida. In 1926 and 1928, hurricanes demolished the region and recovery from the aftereffects only began around World War II. By the 1950s, the population of the region had exploded and today Broward County's industry includes cattle, agriculture, commercial and sport fishing, and tourism.

In 1927, construction started within the current Port Everglades project area on Port Mabel, which originally served as a military facility. During the 1930s, the Port was again heavily utilized by the military and experienced steady growth with expansion of the Port and the creation of additional land based infrastructure. This growth continues today as the Port use will increase well into the twenty first century.

This area of the Florida coastline was the scene of numerous wrecks throughout the eighteenth and nineteenth centuries. Southbound ships hugged the coast to avoid the northward flowing Florida Current/Gulf Stream and northbound ships often found themselves in danger from large storms and hurricanes. Many ships were wrecked off the coast of south Florida. The Florida Master Site File (FMSF) lists 16 historic shipwrecks within the vicinity of the ODMDS project area. One of these, the *USS Copenhagen* is listed on the National Register of Historic Places (NRHP) and three others, including the *Robert Edminster*, have been determined potentially eligible for the NRHP.

There is no potential for submerged prehistoric archeological sites to exist within the ODMDS project area. The ODMDS project area is located off the continental shelf in water depths of 600 to 700 feet, which was never available for human occupation at any time during lower sea levels.

On August 25, 2011, the Florida Division of Historical Resources (DHR) concurred with the USACE's recommendations for the necessity of a submerged cultural resources survey of the ODMDS alternative project areas (DHR Project File No. 2011-03638). This survey was conducted in November, 2011, and resulted in the report titled, *Submerged Cultural Resources Remote Sensing Survey of the Port Everglades Channel and Ocean Dredge Material Disposal Site (ODMDS), Broward County, Florida* (PCI 2011). PCI identified a total of two potentially significant anomalies that may be associated with historic properties within the ODMDS alternatives. These anomalies consisted of one magnetic target with an associated sidescan image and one sidescan image. In July 2012, USACE conducted a refinement survey of the two anomalies and was able to determine that one was debris and the other was a modern, recent shipwreck.

## 3.15 MILITARY USAGE

Broward County is home to the USN's Naval Surface Warfare Center, Carderock Divisions South Florida Ocean Measurement Facility (SFOMF), located just south of Port Everglades at Dania Beach, Florida. This site has been a continuously operating Navy range for over fifty years. The SFOMF performs electromagnetic signature tests of Navy assets. The range is the Navy's only deep and shallow water magnetic research and development ranges (NAVSEA 2012). During naval activities, surface ships and submarines operate in nearby waters as part of testing and exercises. During fiscal year 2011, a total of 26 military ships called at Port Everglades, generating $358,551 for the port (Broward County 2012). Figure 7 shows the location of the proposed ODMDS expansion areas relative to the Navy Use Area.

# 4 ENVIRONMENTAL EFFECTS

This section is the scientific and analytic basis for the comparisons of the alternatives (see Table 4 in Section 2 Alternatives, for summary of impacts). The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects.

## 4.1 GENERAL ENVIRONMENTAL EFFECTS

General environmental effects of disposal of dredged material at this location are discussed in Chapter 4 of the Final Environmental Impact Statement for Designation of the Palm Beach Harbor ODMDS and the Port Everglades Harbor ODMDS (EPA 2004). The two Alternatives considered here are very similar. They have approximately 86 percent of their submerged bottom in common, as is seen in, and both fully contain the existing ODMDS.

Based on an analysis of existing data and the results of the OSV Bold site designation study in May 2011, many of the environmental parameters analyzed are the same for both Alternatives however Alternative 1 will affect less potential hardbottom in the project area. Alternative 1 was chosen as the Preferred Alternative as it is the environmental preferred site and allows for increased operational safety.

Under the no-action alternative, the ODMDS will not be expanded and there will be no additional environmental effects. However, ocean disposal of the anticipated larger quantities of dredged material could occur on a limited basis pursuant to Section 103 of the MPRSA (see Section 2.1.3). The impacts to the marine environment associated with a Section 103 site selection and its limited use would be evaluated by the USACE at the time of selection.

## 4.2 VEGETATION

Since there is no vegetation located in the existing ODMDS, vegetation would not be affected by the No-Action Alternative.

## 4.3 THREATENED AND ENDANGERED SPECIES

The 2004 EIS for the Port Everglades ODMDS designation details the environmental impacts of the current ODMDS and concludes that designation of this ODMDS would not adversely affect, or threaten the continued existence, of any threatened or endangered species. The proposed expanded ODMDS has similar biological and physical parameters. Additionally, no new threatened or endangered species that occur in the proposed expansion area have been designated since the 2004 EIS was finalized, and no new listed species were discovered during the OSV Bold site designation survey (ANAMAR 2012).

As with the original designation of the Port Everglades Harbor ODMDS and as summarized below, selection of either expanded ODMDS (east-west release zone or north-south release zone) will either result in no effect to certain species, or may affect, but is not likely to adversely affect any of the threatened and endangered species described in Section 3.3. Additional information can be found in Appendix B.

### 4.3.1 Whales

In the Concurrence letter for the original designation dated May 24, 2004, NOAA Fisheries states "The use of dredges and the disposal of dredged material using a near-instantaneous dumping type barge or scow have not been shown to adversely affect whales, although the RBO requires dredges to maintain a lookout for right whales and carefully avoid them, and reduce speed in limited visibility. During the recently completed Brunswick Harbor Dredging project, onboard observers detected and avoided right whales on numerous occasions when the dredge was operating or in transit to the Brunswick site. Therefore, NOAA Fisheries believes adverse effects to whales are unlikely to occur from the project." As with the project cited by NOAA Fisheries, any disposal operations taking place in the Port Everglades Harbor ODMDS will be under the authorization of USACE and are covered by the September 25, 1997, Regional Biological Opinion to the Corp of Engineers' South Atlantic Division (SARBO) as updated. The USACE will comply with applicable windows and protective measures for listed species as stated in the most current SARBO. For specific dredging projects not covered by the SARBO, NMFS will be consulted and separate biological opinions may be prepared for those projects. Activities under the SARBO require monitoring and avoidance of large whales during transit to/from disposal sites and during disposal operations. EPA concurs with NOAA Fisheries previous determination and adopts that for this consultation.

### 4.3.2 Turtles

As with whales, sea turtles are high motile animals. NOAA Fisheries has previously reviewed the effects of dredging and disposal operations on the five species of sea turtles that may be in the action area. "Previous NOAA Fisheries' biological opinions issued to the U.S. Army Corps of Engineers in 1991, 1995, 1997, and 2003 have documented that non-hopper type dredges operating in the South Atlantic and Gulf of Mexico are unlikely to adversely affect sea turtles since it is believed that turtles are able to avoid these slower moving dredges. On April 22, 2004, NOAA Fisheries commented on the routine maintenance dredging of the Port Everglades Federal Navigation Project and concluded that no adverse effects to listed species are expected. NOAA Fisheries believes hopper dredging at Port Everglades Harbor falls within the scope of the general type of hopper dredging activities proposed, described, and analyzed in the September 25, 1997, Regional Biological Opinion (RBO) to the Corp of Engineers' South Atlantic Division which amended the regional opinion conducted in 1995, and superseded the interim biological opinion issued on April 9, 1997." As with the project cited by NOAA Fisheries, any disposal operations taking place in the Port Everglades Harbor ODMDS will be under the authorization of USACE and are covered by the SARBO. The USACE will comply with applicable windows and protective measures for listed species as stated in the most current SARBO. For specific dredging projects not covered by the SARBO, NMFS will be consulted and separate biological opinions may be prepared for those projects. Activities under the SARBO require monitoring for impacts to sea turtles during transit to/from disposal sites and during disposal operations. Disposal operations may affect sea turtles swimming in the proposed expansion site by increased turdibity during disposal events. The effect of increased turbidity on sea turtles is expected to be minimal due to the short duration of the reduced water clarity. EPA concurs with NOAA Fisheries previous determination and adopts that for this consultation.

#### 4.3.3 Sawfish

In the May 2004 consulation for the original designation of the Port Everglades Harbor ODMDS, NOAA Fisheries states "The smalltooth sawfish (Pristis pectinata) may also occur off Florida. However, the occurrence of smalltooth sawfish has not been documented within the vicinity of the action area for this project. Therefore, since there is no evidence suggesting smalltooth sawfish occur within the action area, and because these species are highly mobile and likely are to move away from the area during the dredging activities if they happened to be present, we believe no effects to the smalltooth sawfish are likely to occur from the project." EPA concurs with NOAA Fisheries previous determination and adopts that for this consulation.

#### 4.3.4 *Acropora* and Designated critical habitat

Neither elkhorn coral (*Acropora palmata)* nor staghorn coral *(Acropora cervicornis)* are found in waters exceeding 30 meters (approximately 99 feet) (NMFS, 2005). There are no documented Acroporid corals in the transit path from the existing Port Everglades entrance channel to the proposed ODMDS expansion sites. And per the previously referenced studies, there are no Acroporid corals within 500 feet, north or south, of the existing or proposed expanded channel boundaries. Impacts associated with transit by dredges and or tugs/scows have been/are being consulted on by USACE in association with the Port Everglades expansion project, or the Port Evergladesd ongoing O&M activities. Water depths at either of the proposed expansion sites range from 604-735 feet in depth. This exceeds the maximum recorded depths for either Acropora species, and thus, EPA believes the action of designation of the newly expanded site will have no effect on listed Acroporid corals. Designated critical habitat for Acroporid corals extends from mean high water to 30 meters. Both of the proposed sites are in waters that exceed those depths. Designation of an expanded ODMDS at Port Everglades will not adversely modify designated critical habitat for Acroporid corals.

With the No-Action Alternative, there will be no additional affect to threatened or endangered species beyond those impacts assessed in the 2004 EIS for the ODMDS designation.

### 4.4 HARDBOTTOM HABITATS

Hardbottom habitats potentially affected by this action include coral reefs located west of the alternatives (Figure 13) and non-reef hardbottom habitats within the proposed expansion areas (Figure 15).

Potential indirect effects to the coral reefs include transport of disposal plumes shoreward towards the nearshore reefs located in less than 30 meters (100 ft) of water. The outermost reefs are located approximately 2.5 nmi (4,630 meters) west of the center [1.8 nmi (3,333 meters) west of western edge] of the proposed ODMDS expansion area. By expanding the sites with either alternative, the western edge of the expanded ODMDS will be approximately 0.5 nmi (926 meters) closer to the third reef line than it is with the existing ODMDS boundaries. The potential for turbidity plumes to reach these areas was evaluated by the USACE. Extreme (99 percentile) westerly currents were modeled and silt-clay concentrations were predicted to diminish rapidly to less than 1 mg/l within 1,500 meters of the disposal location. Sand concentrations were predicted to diminish to less 1 mg/l within 2,400 meters (CERC 1998). As part of the monitoring efforts associated with the Miami ODMDS, located a similar distance offshore and with a similar relationship to the Florida Current, currents were monitored for exceedence of a 12 cm/sec (1 hour average) shoreward threshold. The 12cm/sec threshold was determined as the velocity necessary to transport plumes to the nearshore reefs (Proni *et al.* 1998). Evaluation of more than a year's worth of records determined that the 12 cm/sec threshold was only exceeded 2.5 percent of the time (Proni *et al.* 1998). Most of these exceedences were only short duration (<2 hrs) and only 11 exceeded five hours. Therefore, the potential for indirect effects on the nearshore reefs is minimal.

Possible hardbottom associated with rubble areas within the proposed ODMDS expansion areas is possible. Direct impacts are limited to these areas. Any rubble areas could be significantly affected by burial. Multi-dump fate (MDFATE) modeling was conducted on the 6.63 mcy of dredged material estimated to come from the proposed Port Everglades Harbor deepening project. This is the largest project anticipated to utilize the ODMDS. The model estimated the area and thickness of material deposition when disposed from a pre determined disposal release zone within Alternative 1 and Alternative 2. Contours were developed to show the estimated area covered by more than five but less than ten cm and ten or greater cm dredged material thickness layers (Figure 2). The amount of seafloor expected to be covered by more than five but less than ten cm of dredged material for Alternative 1 is approximately 0.36 nmi$^2$ (230 acres). The amount of seafloor expected to be covered by 10 or greater cm for Alternative 1 is approximately 1.06 nmi$^2$ (678 acres) (Table 17). For Alternative 2, the amount of seafloor expected to be covered by more than five but less than ten cm is approximately 0.39 nmi$^2$ (250 acres). The amount of seafloor expected to be covered by 10 or greater cm for Alternative 2 is approximately 1.33 nmi$^2$ (851 acres) (Table 17). Both alternatives include a portion of the existing site in the coverage estimate.

**Table 17. Estimated area of dredged material deposition.**

| | Total Site Size (ac) | Estimated area (ac) covered by 5 to less than 10 cm material | Estimated area (ac) covered by ≥10 cm material |
|---|---|---|---|
| Alternative 1 | 2,721 | 230 (8.5%) | 678 (25%) |
| Alternative 2 | 2,449 | 250 (10.0%) | 851 (34.7%) |

The contours were overlaid on the cultural resources side-scan sonar mosaic to examine the number of targets covered by the more than five but less than ten cm of dredged material and greater than 10 cm layers for Alternative 1 (Figure 26) and Alternative 2 (Figure 27). To be as conservative as possible, USACE and EPA classified all non-manmade targets detected in the survey as "hardbottom". The size of each target was calculated and the total area of potential hardbottom affected by the estimated material deposition tabulated for both alternatives (Table 18).

**Table 18. Total area of potential hardbottom affected by the estimated material deposition**

| | Total Site Size (ac) | Targets (ac) covered by 5 to less than 10 cm of material | Targets (ac) covered by ≥10 cm of material |
|---|---|---|---|
| Alternative 1 | 2,721 | 1.33 (0.05%) | 1.36 (0.05%) |
| Alternative 2 | 2,449 | 1.41 (0.06%) | 2.89 (0.12%) |

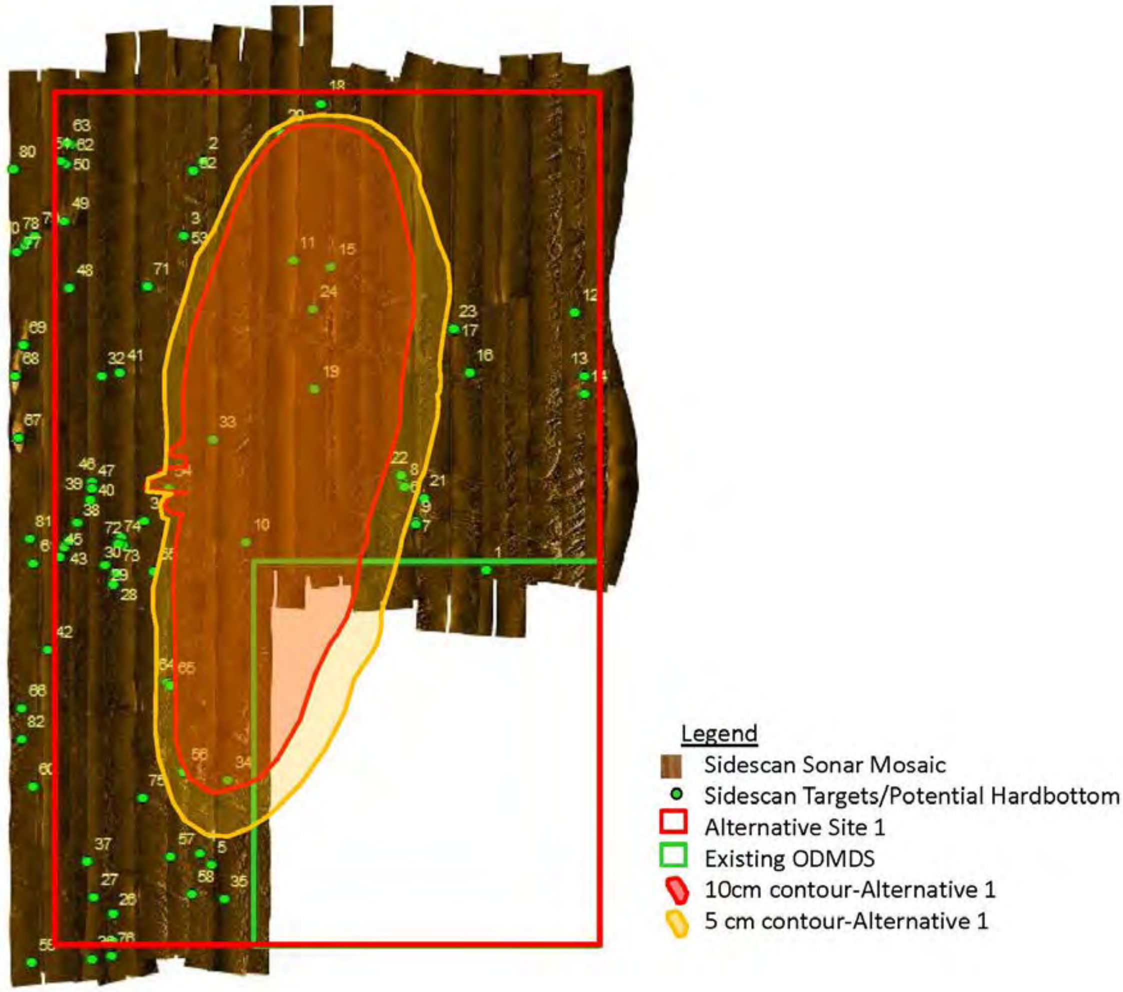


**Figure 26. Overlay of predicted disposal footprint for Alternative 1 on potential hardbottom targets as identified from sidescan sonar mosaic. 10 and 5 cm contours indicate dredged material layer thickness**

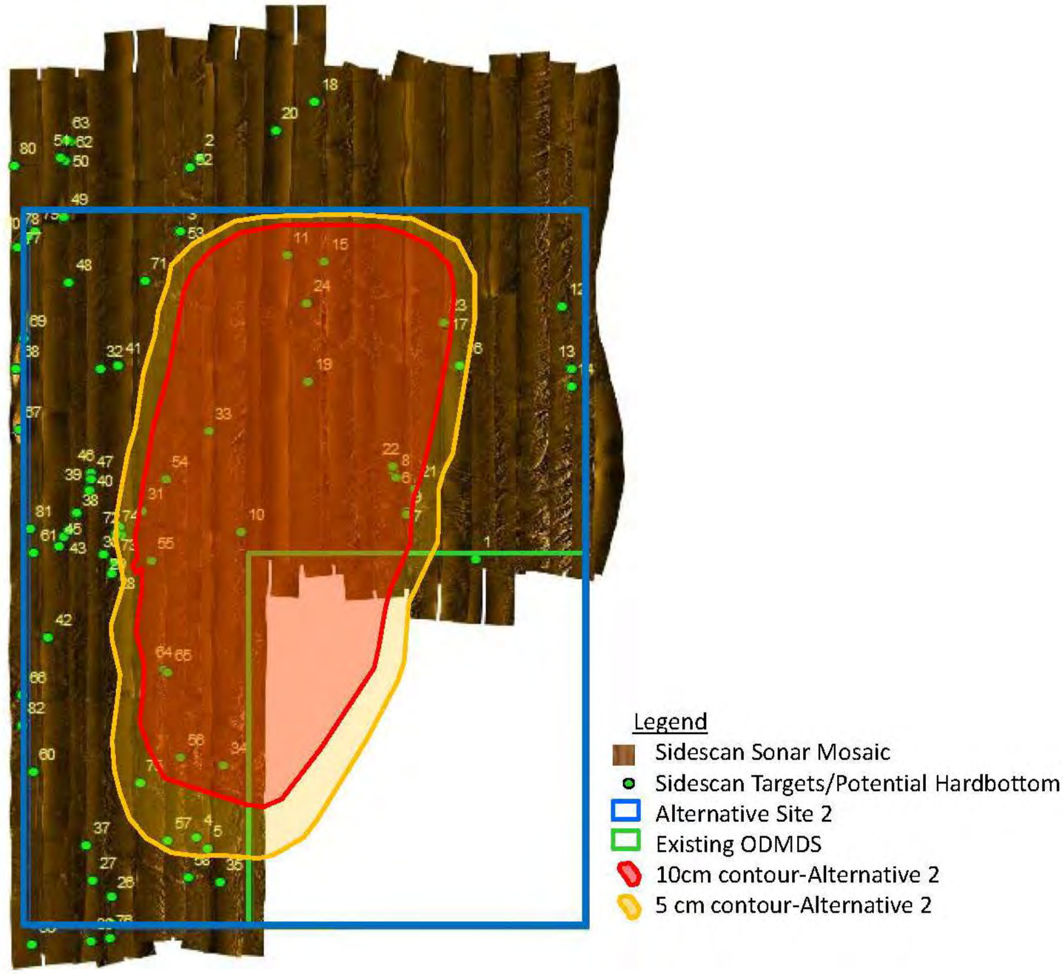


**Figure 27. Overlay of predicted disposal footprint for Alternative 2 on potential hardbottom targets as identified from sidescan sonar mosaic. 10 and 5 cm contours indicate dredged material layer thickness.**

Based on the photographic and side scan sonar data for estimated hardbottom as presented in Section 3.4 and above, Alternative 1 will have less impact on potential hardbottom within the project area.

Under the No-Action Alternative, no additional impacts beyond those assessed in the 2004 EIS for the ODMDS designation for site designation are expected.

## 4.5 FISH AND WILDLIFE RESOURCES

Breeding, spawning, and feeding activities of fish undoubtedly occurs in the proposed expansion areas; however, these activities are not believed to be confined to, or concentrated in, the proposed expansion areas. Most of the larger species are highly mobile and can avoid the area during a disposal event. Thus, these populations will not be impacted by disposal events

Smaller organisms inhabiting the water column such as phyto-, icthyo- and zooplankton have limited mobility and some of these individuals may be impacted during a disposal event. However these species have a prolific capacity to reproduce and any effect to the populations of these smaller species arising from the impacts resulting from a disposal event would be temporary and minor.

Benthic organisms inhabiting the soft bottom habitats in the proposed expansion areas include epifaunal (organisms that live on the sediment), infaunal (organisms that live within the sediment). Disposal events will cover some portion of a proposed expansion area and may result in minor and temporary impacts to the benthic community. The degree to which these species are affected depends on the amount of material deposited and the composition (sediment structure) of this material. Model results of the amount of material deposited are discussed in Section 4.3 above and summarized in Table 17.

The benthic community is highly dynamic and capable of recovering from short term perturbations such as a disposal event. Some species are capable of burrowing back to the surface if covered by sediment while individuals of other species will re-occupy the newly created soft bottom habitat. Depending on whether the sediment composition changes, species composition may also change as some benthic species have a preference for a particular range of grain sizes.

Slow-moving epifaunal invertebrates may be buried and smothered as dredged material is deposited. Recolonization of a disposal mound can begin within a few days after dumping (Germano and Rhoades 1984). Adult infaunal organisms buried under thin overburden layers (<10cm) have an upward escape response. The thicker part of the deposit is primarily recolonized through larval recruitment or immigration of organisms from adjacent, undisturbed areas. Macroinfaunal recolonization occurs in three stages: (1) small opportunistic polychaetes; (2) dense aggregations of tubiculous amphipods and tellinid bivalves; and (3) deep burrowing polychaetes, caudate holothurians, infaunal ophiuroids, or burrowing urchins (Rhoads and Germano 1986). Larval recruitment and establishment by all stages following disposal can require several years (Rhoads et. al 1978). However, tropical soft-bottom macrobenthic assemblages can respond quickly (three months) to the disturbance associated with the dumping of dredged material (Cruz-Motta and Collins 2004). In 2006, USEPA conducted a study of the recovery of the benthic communities at the existing Port Everglades Harbor ODMDS. Approximately nine months after disposal of 60,000 cubic yards of material at the existing ODMDS, Stage 2 and increasing numbers of Stage 3 communities recolonized the area; this largely represented a return to ambient conditions relatively soon following disposal (Germano & Associates, Inc. 2006). Germano & Associates, Inc. (2006) suggested that the native benthic communities in the ODMDS are subjected to high current velocities and are adapted to frequent physical disturbance, thus having relatively rapid recolonization.

Therefore, designation of either alternative for the Port Everglades Harbor ODMDS would only have minor and temporary effects and would not have any long-term adverse effects on the continued existence of fish and wildlife resources. Effects will be monitored consistent with the Site Management and Monitoring Plan (Appendix D).

Under the No-Action Alternative, operations and maintenance activities would continue. These activities may have minor and temporary effects but would not have any long-term adverse effects on the continued existence of fish and wildlife resources as previously evaluated in the 2004 EIS for the ODMDS designation.

## 4.6 ESSENTIAL FISH HABITAT

Section 3.6 describes the existing conditions of the Essential Fish Habitat (EFH), Federally managed fisheries, and associated species such as major prey species, including affected life history stages. The following describes the individual and cumulative impacts of the proposed alternatives on EFH, Federally managed fisheries, and associated species such as major prey species, including affected life history stages. Additional details are provided in the Essential Fish Habitat Assessment included as Appendix C.

Expanding the Port Everglades Harbor ODMDS may temporarily affect EFH and Federally managed fisheries. Impacts such as increased turbidity, and the release of sediment-bound contaminants, may have a minor and short-term (several hours to days) impact on the water column following the discharge of solids and solutes from a barge (Gordon 1974). The latter is will be minimized as all material will be evaluated for compliance with the Limiting Permissible Concentrations and be determined suitable for ocean disposal. Thus dredged material is not expected to have an impact on EFH or local fauna.

Direct and indirect impacts to the water column and benthos will be mitigated through appropriate testing of the dredged material prior to disposal. The greatest potential for impact would likely occur as a result of accumulation of dredged material and associated changes in sediment characteristics that may cause impacts to benthic-dwelling organisms and the burial of rubble zones within the proposed ODMDS boundaries. However, as discussed in Section 5.0 of the draft EFH assessment, the benthic community in the area of the proposed ODMDS expansion is adapted to frequent physical disturbance due to high current velocities in the general area.

Effects of the expanded ODMDS to Federally managed species are as follows:

- The Royal Red Shrimp – Royal red shrimp EFH includes the upper regions continental slope in 590 -2,395 ft (180-730 m) depths, over mud/sand substrate and the Florida Current/Gulf Stream as it provides a dispersal mechanism for larvae. Dredged material disposal may bury the bottom habitat and less-motile fauna and affect feeding. Disposal may temporarily increase turbidity levels, potentially clogging gills of organisms and altering behavior patterns and feeding.  Deposition of material with higher silt content could alter the sandy bottom type in the disposal areas.  Royal red shrimp can utilize a variety of bottom types including muddy sand or sand, and any effects on royal red shrimp within the project area would vary.  Depending upon the volume of dredged material placed on the habitat, recovery may not occur or the impacts may only be minimal and temporary.  Based on the USEPA's 2006 monitoring of the 2005 disposal event, bottom sediments had recovered to approximately pre-project conditions within a year.  Adverse impacts to the Florida Current/Gulf Stream are not expected.

- Golden Crab – EFH for golden crab includes the U.S. Continental Shelf through the Florida Straits; in addition, the Florida Current/Gulf Stream is EFH because it provides a mechanism for larval dispersal.  Dredged material disposal may bury the bottom habitat and less-motile fauna and affect feeding.  Disposal may temporarily increase turbidity levels, potentially clogging gills of organisms and altering behavior patterns and feeding. Deposition of material with higher silt content could alter the sandy bottom type in the disposal areas.  Golden crabs can utilize a variety of bottom types including substrates containing a mixture of silt-clay and foraminiferan shell, unconsolidated bottom, including ripple habitat, dunes, soft bioturbated habitat, and low relief and any effects on golden crab within the proposed ODMDS expansion area would vary.  Depending upon the volume of dredged material placed on the habitat, recovery may not occur or the impacts may only be minimal and temporary.  Based on the USEPA's 2006 monitoring of the 2005 disposal event, bottom sediments had recovered to approximately pre-project conditions within a year.  Adverse impacts to the Florida Current/Gulf Stream are not expected.

- Snapper-Grouper Complex – Areas which meet the criteria for EFH-HAPC in the vicinity of the proposed ODMDS expansion area include live/hardbottom, artificial reefs and medium-to-high profile offshore outcroppings on and around the shelf break zone from shore to at least 600 ft (183 m) [but to at least 2,000 ft (610 m) for wreckfish].  EFH also includes the water column above the adult habitat and the additional pelagic environment, including *Sargassum* and the Florida Current/Gulf Stream as it provides a dispersal mechanism.  Surveys at the ODMDS expansion areas indicate that little potential exists for these habitats, with the exception of the limited rubble areas, to exist in the proposed expansion areas.  Disposal could increase turbidity levels, potentially clogging gills of organisms and altering behavior patterns and feeding. Adverse impacts to the water column, Florida Current/Gulf Stream, and/or *Sargassum* are not expected.

- Highly Migratory Species - EFH in the vicinity of the proposed ODMDS expansion for highly migratory species is limited to the water column, the Florida Current/Gulf Stream in particular, and *Sargassum*. Highly migratory species are very motile and would be unlikely to be buried by dredged material disposal. Disposal may temporarily increase turbidity levels, potentially clogging gills of organisms and altering behavior patterns and feeding. Adverse impacts to the water column, Florida Current/Gulf Stream, and/or *Sargassum* are not expected.

- Coral, Coral Reefs, and Live/Hardbottom Habitat - EFH for ahermatypic stony corals, which are not light restricted, extends to outer shelf depths. EFH for black corals includes rough, hard, exposed, and stable substrate that is located offshore in high salinity waters in depths exceeding 18 meters. EFH for octocorals includes rough, hard, exposed, stable substrate in subtidal to outer shelf depths within a wide range of salinities and light penetration. Only small areas of hardbottom were observed in the ODMDS expansion areas, primarily in the northernmost suspected hardbottom area, and cobble-sized carbonate rocks and several pieces of dead rose coral were only found in one trawl sample. No live hard corals were observed in the ODMDS expansion areas. Although a small amount of hardbottom may become buried by dredged material, live corals are unlikely to be affected. Some of the dredged material may contain rocks or other material that may increase the amount of hardbottom in the ODMDS expansion areas. MDFATE modeling has suggested that most (1-cm contour) of the dredged material would remain within the ODMDS expansion areas. Depending on prevailing current patterns at the time of disposal, there is a slight chance that hardbottom areas outside the ODMDS expansion areas could be affected by turbidity from disposal.

Under the No-Action Alternative, essential fish habitat would not be additionally affected beyond what was assessed in the 2004 EIS for the ODMDS designation.

## 4.7 COASTAL BARRIER RESOURCES

The proposed ODMDS expansion will occur in offshore waters approximately 4 nmi from the mainland and will have no impact on coastal barrier resources.

The No-Action Alternative will have no additional impact on coastal barrier resources beyond what was assessed in the 2004 EIS for ODMDS designation.

## 4.8 WATER QUALITY

The selection of either alternative will have only temporary and minor impacts to water quality.

During periods of dredged material disposal there will be temporary, localized increases in water column turbidity and concentrations of dissolved and particulate constituents. Dissolved oxygen concentrations may decrease in the dump plume. Chemically reduced inorganic compounds associated with particles sinking through the upper water column may be oxidized, causing a transient increase in the chemical oxygen demand. Oxidation of labile organic material may consequently reduce dissolved oxygen concentrations in the water. However, because the water column is well oxygenated, offsite impacts are not expected and any onsite impacts should be of short duration. Plumes of suspended sediments would result in increases in turbidity levels, suspended particulate concentrations, and decreased light transmittance. These effects will be dissipated by natural dispersion, mixing, and eventual sinking of particles. Based on dispersion modeling conducted for the Port Everglades Harbor ODMDS, any temporary perturbations in water quality resulting from disposal of dredged material would be reduced to ambient or undetectable levels within a short distance of the release point (USEPA 2004).

Only dredged material evaluated and found acceptable in accordance with the joint USEPA/USACE guidance (USEPA/USACE, 1991 and USEPA/USACE, 2008) can be disposed in the ocean. The testing evaluates the potential for unacceptable effects such as toxicity and bioaccumulation. These required tests reduce the possibilities of unacceptable water column and benthic effects caused by dredged material contaminants. Additionally, Federal marine water quality criteria (CMC) will not be exceeded at any time outside the ODMDS boundaries or after 4 hours of disposal within the ODMDS.

The No-Action Alternative will have no additional impact on water quality beyond what was assessed in the 2004 EIS for ODMDS designation.

## 4.9 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

High-level radioactive wastes are prohibited from ocean disposal (40 CFR 227.5) and low-level radioactive waste disposal requires congressional approval for ocean disposal (33 U.S.C. 1414). ODMDS use will be limited to dredged material disposal. All dredged material must be evaluated and shown that no undesirable effects will occur due to chronic toxicity (40 CFR 227.6). Therefore, none of the Alternatives, including the No Action Alternative, will be affected by hazardous, toxic, or radioactive waste.

## 4.10 AIR QUALITY

Selection of either expansion site will result in short-term impacts from increased dredge, barge, or scow traffic associated with transporting disposal material. However, no significant impacts to regional air quality are expected as a result of the transport and disposal of dredged materials to any of the proposed alternative sites. Air quality impacts at dredging sites associated with the dredge plant during dredging operations were not assessed in this EIS as they will be assessed on a project-specific basis. Emissions from the tug vessels and hopper dredges include particulate matter (PM), nitrogen oxides (NOx), sulfur dioxide (SO2), carbon monoxide (CO), and volatile organic carbons (VOCs; hydrocarbons). Estimated emission rates for the existing ODMDS were presented in Section 4.15 of the FEIS (USEPA, 2004) and are not expected to differ for the expanded ODMDS. Emissions associated with the dredging of material in Port Everglades are not a part of this action. Thus, the impacts will be minor and temporary.

The No-Action Alternative is expected to have no additional impact on air quality beyond what was assessed in the 2004 EIS for ODMDS designation.

## 4.11 NOISE

The noise at either expansion site would increase during disposal of dredged material however the impacts will be minor and temporary. Surface noise for a tugboat is expected to be 82 dB at 50 ft. (Port of Oakland and the USACE San Francisco District 1998). Noise from the tugboats hauling barges or from hopper dredges to and from the ocean disposal sites would be too far from shore to have any meaningful noise impact on noise-sensitive land uses.

Subsurface noise would also increase during disposal and monitoring activities in the vicinity of the proposed expansion sites. This elevated noise level will be temporary and would not be expected to result in any significant adverse impacts to wildlife or aquatic organisms in the areas. Additional discussion of noise issues at the alternative sites is found in the 2004 EIS for the ODMDS designation (USEPA 2004).

The No-Action Alternative would have no additional impact on the noise environment beyond what was assessed in the 2004 EIS for ODMDS designation.

## 4.12 RECREATION RESOURCES

The coastal waters of Broward County are used for a variety of recreational activities including swimming, water skiing, sailing, boating, surfing, skin diving, and SCUBA diving. Few of these activities occur in, and none is restricted to, the proposed ODMDSs because of depth of water and distance offshore are not where these activities typically occur. Thus, the selection of either alternative would not have any impacts to recreation.

The No-Action Alternative will have no additional impact on recreation beyond what was assessed in the 2004 EIS for ODMDS designation.

## 4.13 NAVIGATION AND PUBLIC SAFETY

Selection of either proposed site would is unlikely to impact navigation or public safety. The expansion areas lie inshore of the two primary offshore north-south traffic patterns and in an area of relatively low vessel activity (see Section 3.13). Both alternatives are not located in any restricted passage areas, precautionary zones, or anchorages. Adequate public notice to mariners will be issued by the U.S. Coast Guard in advance of such disposal events. Furthermore, because the ultimate purpose of dredging operations is to provide adequate water depths and access to vessel traffic for channels and berths within Port Everglades Harbor, the proposed action could be considered a beneficial impact.

The No-Action Alternative would have no additional impact on navigation and public safety beyond what was assessed in the 2004 EIS for ODMDS designation.

## 4.14 HISTORIC AND CULTURAL RESOURCES

A submerged cultural resources survey, incorporating the use of a magnetometer and sidescan sonar, was conducted in November 2011, within the Port Everglades ODMDS project alternative areas pursuant to the Florida Division of Historic Resources Performance Standards for Submerged Remote Sensing Surveys (Florida DHR, Version 2.1). The resulting report, Submerged Cultural Resources Remote Sensing Survey of the Port Everglades Channel and Ocean Dredge Material Disposal Site (ODMDS), Broward County, Florida (PCI, 2011) recommended one magnetic and two sidescan anomalies that possessed characteristics of potentially significant historic resources (shipwrecks) for avoidance or further investigation. USACE conducted a refinement investigation of the three, potentially significant anomalies in July, 2012, to determine if they represented significant historic properties. The anomalies were identified as debris and a modern, recent shipwreck. USACE has determined no effects to historic properties.

According to the 2004 EIS for the ODMDS designation, there are no natural or cultural features of historical importance in or near the existing ODMDS. Therefore, no effects to submerged historic properties under the no-action alternative are anticipated. No portion of the proposed project exists within or adjacent to any Native American properties.

## 4.15 ENERGY REQUIREMENTS AND CONSERVATION

The energy requirements for this activity are limited to fuel for transportation of the dredged material to the disposal site. As the proposed sites are essentially in the same location, the selection of either alternative would require the same amount of energy.

The No-Action Alternative would have no additional impact on energy requirements and conservation beyond what was assessed in the 2004 EIS for ODMDS designation.

## 4.16 NATURAL OR DEPLETABLE RESOURCES

In this case, the depletable resources would be the fuel for the transportation of the dredged material to the disposal site equipment and human energy required for the project. As the proposed sites are essentially in the same location, the selection of either alternative would require the same amount of natural or depletable resources.

The No-Action Alternative would have no additional impact on natural or depletable resources beyond what was assessed in the 2004 EIS for ODMDS designation.

## 4.17 CUMULATIVE IMPACTS

Cumulative impact is the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7)."

### 4.17.1 Past Projects

#### *4.17.1.1 USEPA Interim-Designated ODMDSs*

Dredged material disposal occurred at a USEPA interim-designated ODMDS. The interim site for Port Everglades Harbor was discontinued after a 1984 USEPA survey indicated that some damage to nearby inshore, hard bottom areas may have occurred due to the movement of fine material associated with disposed dredged material.

### 4.17.2 Current Projects

#### *4.17.2.1 Maintenance of Port Everglades Harbors Federal Navigation Project*

This project will continue to require periodic dredging to maintain adequate depths for access and safe navigation. Ocean dredged material disposal will continue to be required for this project. The need for ocean disposal is based primarily on the lack of economically, logistically, and environmentally feasible alternatives for the disposal of the projected quantities of dredged material deemed unsuitable for beach nourishment or other beneficial uses (USACE 2005).

#### *4.17.2.2 Wastewater Outfalls*

Cumulative impacts from the wastewater outfalls was discussed in the FEIS (USEPA 2004). Cumulative impacts are limited to water quality effects. Effects from site expansion is not expected to differ from that discussed in the FEIS (USEPA 2004).

### 4.17.3 Reasonably Foreseeable Future Projects

#### *4.17.3.1 Offshore Wind and Hydrokinetic Facilities*

The BOEM issues leases and grants for both offshore wind and hydrokinetic projects and permits the construction and operation of offshore wind farms; however, the Federal Energy Regulatory Commission (FERC) permits the development of hydrokinetic facilities. BOEM has prepared an Environmental Assessment for the proposed lease of OCS blocks 7003, 7053, and 7054 (77 FR 24735). However, those areas were determined to be outside of the ODMDS expansion area. Florida Atlantic University (FAU) is requesting leases for additional OCS blocks (blocks 7040 and 7001) that could overlap with the ODMDS expansion area (Figure 28).

FAU has applied to BOEM for a lease to deploy an experimental demonstration device about 17 miles off the coast of Fort Lauderdale. The Southeast National Marine Renewable Energy Center, operated by FAU, is exploring the potential for harnessing the Florida Current. A single-anchor mooring and buoy would be used to test equipment that could generate electricity from the Florida Current. Devices to be deployed would be limited to 100 kilowatts of capacity and 23-foot-diameter rotors.

According to BOEM (2012) the primary impact-producing activity associated with hydrokinetic activities is vessel traffic. Additional vessel strikes to marine mammals and sea turtles and conflicts with navigation are expected to be insignificant. Impacts from vessel discharges and potential spills are not expected to cause a significant impact to water quality. The impacts of the proposed action to the benthic resources are expected to be minimal to non-existent and limited to periods during the actual deployment of the mooring system, and periodic impacts to the seafloor from contact of the shock chain with the seafloor (e.g. chain sweep). The total potential area of disturbance over the 5-year lease period is estimated at 0.0325 square km (0.0125 mi) which is a negligible percentage of the total benthic habitat on the Miami Terrace. (BOEM 2012)

#### *4.17.3.2 Navigation Improvements to the Federal Project at Port Everglades Harbor*

A feasibility study and Environmental Impact Statement are currently being developed for navigation improvements to the Federal Navigation Project at Port Everglades Harbor. The study addresses potential channel and basin deepening and widening, that may be required to increase safety for the existing and future fleet, decrease costs associated with vessel delays due to congestion, channel passing restrictions and berth deficiencies as well as decrease transportation costs through increasing ecomonies of scale for cargo and petroleum products. . To date, the Preferred Alternative has not been selected, however the maximum project footprint is for an Outer Entrance Channel -57 feet deep (plus one foot of required overdredge and one foot of allowable overdredge for a total dredge depth of -59 ft MLLW) from the sea buoy to the jetties then transitioning to an Inner Entrance Channel at 50 feet deep (plus one foot required overdredge and one foot allowable overdredge for a total dredge depth of -52 ft MLLW). The channel depth of 50 feet (-52 ft total dredge depth) continues into the Main Turning Basin, Widener, Southport Access Channel, and Turning Notch (deepening only from -46 to -50 feet plus one foot of required overdredge and one foot of allowable overdredge for a total dredge depth of -52 ft MLLW). The South Turning Basin, and Dania Cutoff Canal improvements are not included in the Preferred Alternative.

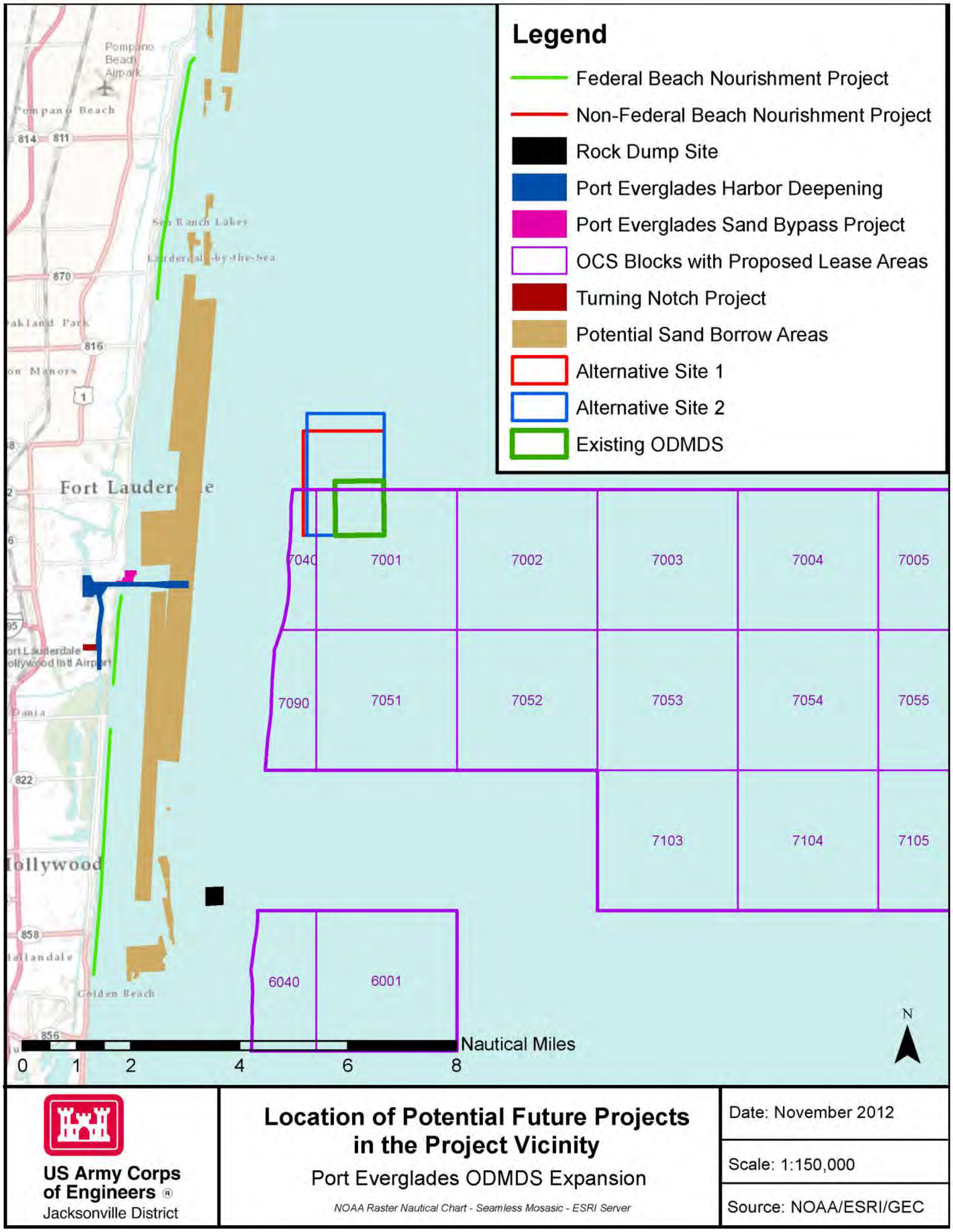


**Figure 28. Reasonably Foreseeable Future Projects**

The Preferred alternative may generate up to approximately 6.63 mcy of dredged material. A small portion of the material will be utilized for construction of mitigation measures with the remaining portion of the material being placed in the ODMDS (Jerry W. Scarborough, USACE, personal communication, letter dated Apr. 27, 2010). The analysis assumes that the Turning Notch would be improved by Port Everglades to provide a depth of 42 feet. The TSP plan includes deepening approximately 1,500 linear feet of the turning notch from the existing 42 feet to 50 feet (plus one foot of required overdredge and one foot of allowable overdedge for a total dredge depth of -52 ft MLLW) and is the responsibility of USACE. Impacts from ocean disposal would be similar to that as described in Section 3; however, the total seafloor area to be impacted would be a function of the total volume of material for disposal. Material dredged from the Turning Notch expansion will go to an upland site, and will not be disposed of in the ODMDS (Port Everglades, personal communication, 2012).

#### *4.17.3.3 Port Everglades Master Plan (Turning Notch Improvements)*

The Turning Notch would be expanded by Port Everglades to provide a depth of -42 feet to accommodate larger ships and create additional berth space for the current class cargo ships calling at Port Everglades. This project is included in the Port's five-year Capital Improvement Program from the 2006 Port Everglades Master/Vision Plan. Material dredged from the Turning Notch expansion will go to an upland site, and at this time is not expected to be disposed of in the ODMDS (Port Everglades, personal communication, 2012).

#### *4.17.3.4 Broward County Storm Damage Reduction/Shore Protection Project*

The Federal storm damage reduction/shore protection project allows for the restoration of beaches to a general width of 100 ft with a berm elevation of 10 ft above mean low water, and periodic nourishment thereafter. Dredged material from Port Everglades harbor that is beach quality may be used for these projects. The storm damage reduction/shore protection project is a nearshore activity, and would not likely result in impacts to offshore environments. Small amounts of rock screened from the sand may be placed in the ODMDS.

#### *4.17.3.5 Port Everglades Entrance Sand Bypass Project*

The Port Everglades Sand Bypass Project proposes to create and modify inlet infrastructure on the north side of the inlet sufficient to facilitate the economical collection of littoral materials that will be available for future mechanical bypassing to the beaches south of the inlet. The project will include the creation of a sand trap, modification to and improvement of the existing north jetty, removal of a portion of the rubble spoil shoal north of the inlet, construction of a rock rubble barrier at the western extent of the remaining rubble shoal, and construction of a small interior groin on the western end of the north jetty notch. Disposal events will be managed per the attached SMMP (Appendix D).

A primary component of the sand bypass project will be a 7.1 acre (2.87 hectare) sand trap excavated to an elevation of -49 ft (-14.9 meters), NAVD88. The sand trap will be located on the north side of the Port Everglades Entrance channel immediately adjacent to the north jetty. Creation of the sand trap will include the excavation of approximately 325,000 cubic yards (248,500 cubic meters) of sand, rubble, and rock. Of this, it is expected that up to 45,000 cubic yards (34,400 cubic meters) of the material is a mixture of beach compatible sand and rock rubble. The balance of the material is limestone (carbonate) rock of varying characteristics and granite boulders and granite stone debris from the old jetty. An attempt will be made to recover and re-use some if not all of the collected boulders along sections of the planned jetty improvements. Otherwise, it is expected that these materials will be disposed of in the ODMDS.

This project would also include removal of approximately 125,000 cy (95,600 cubic meters) of rubble from the rubble spoil shoal located approximately 800 ft (243 m) north of the north jetty down to natural hardbottom or a maximum depth of about -20 ft (-6.1 m) NAVD88. The material will be loaded onto scows and towed offshore to the ODMDS for disposal. Impacts from ocean disposal would be similar to that as described in Section 3; however, the total seafloor area to be impacted would be a function of the total volume of material for disposal.

#### 4.17.4 Conclusions

The designation of an expanded ODMDS is not expected to introduce new human activities in the project vicinity. Commercial shipping and recreational and commercial fishing are expected to continue. Increased vessel traffic associated transportation of dredge material may lead to an increased risk of collisions with vessels transiting to and from the ODMDS expansion area. The increased vessel traffic associated with these projects may also affect water quality at a greater frequency than existing circumstances. These effects are expected to be temporary.

The proposed expansion areas are not expected to contribute to any cumulative impacts of the past, present and reasonably foreseeable future actions described above. Except for possible impacts to an extremely limited amount of hardbottom, the impacts of the proposed expansion areas and expected to be temporary and minor to threatened and endangered species, water quality, fish and wildlife resources and essential fish habitat.

### 4.18 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

#### 4.18.1 Irreversible

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. One example of an irreversible commitment might be the mining of a mineral resource.

Designation of either proposed expansion area will not result in the irreversible ability to use and/or enjoy any resources.

The No-Action Alternative would have no additional impact on natural or depletable resources beyond what was assessed in the 2004 EIS for ODMDS designation.

#### 4.18.2 Irretrievable

An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. An example of an irretrievable loss might be where a type of vegetation is lost due to road construction.

Designation of either proposed expansion area will not result in the irretrievable commitment of resources. Other than creating a potential for altering the structure of benthic communities by possibly changing the characteristics of the substrate, no irretrievable loss of resources is expected.

The No-Action Alternative would have no additional impact on natural or depletable resources beyond what was assessed in the 2004 EIS for ODMDS designation.

## 4.19 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Unavoidable adverse environmental effects are not expected to differ from the original site designation for either alternative. See Section 4.3.6 of the 2004 FEIS (USEPA, 2004).

## 4.20 LOCAL SHORT-TERM USES AND MAINTENANCE/ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Use of the proposed ODMDS in the manner described should have no effect on long-term productivity. Effects are not expected to differ from that presented in the original site designation FEIS. See Section 4.6 of the 2004 FEIS (USEPA 2004).

## 4.21 INDIRECT EFFECTS

The proposed action may facilitate area dredging projects by providing a disposal option and thereby increase the associated environmental impacts of dredging (water quality degradation, wetland losses). The proposed action would benefit the shipping industry and economy.

## 4.22 COMPATIBILITY WITH FEDERAL, STATE, AND LOCAL OBJECTIVES

The proposed action is expected to be consistent with Federal, State and local plans and objectives.

The proposed project was proposed by the USEPA and USACE Jacksonville District and is compatible with federal objectives. The project is being reviewed by the state of Florida for consistency with the state's coastal zone management plan.  Local government (Broward County) is the originator of the plan to expand Port Everglades.

## 4.23 CONFLICTS AND CONTROVERSY

No known conflicts or controversy have been identified from the public or government agencies.

## 4.24 UNCERTAIN, UNIQUE, OR UNKNOWN RISKS

The EIS for the designation of the existing ODMDS (USEPA, 2004) did not identify any uncertain, unique or unknown risks associated with designation of the existing ODMDS.  No new risks have been identified that are associated with either proposed expansion sites.

## 4.25 PRECEDENT AND PRINCIPLE FOR FUTURE ACTIONS

Selection of an expanded ODMDS would create a larger ODMDS in the Atlantic Ocean to be used for the disposal of dredged material associated with port expansion activities and future maintenance dredged material from the Port Everglades Harbor Federal Navigation Project and other local projects.

## 4.26 ENVIRONMENTAL COMMITMENTS

USACE and the USEPA commit to the following commitments:

- Disposal of dredge material will meet the standards set by USEPA and USACE; and
- Environmental monitoring of the expanded ODMDS, dependent upon available funding.

Please refer to the SMMP for additional information in Appendix D.

## 4.27 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

### 4.27.1 National Environmental Policy Act of 1969

Environmental information on the project has been compiled and this Environmental Assessment has been prepared.  The project is in compliance with the National Environmental Policy Act.

### 4.27.2 Endangered Species Act of 1973

Consultation will be initiated with NOAA Fisheries by USEPA with the Biological Assessment included in Appendix B of this EA.  This project will be fully coordinated under the Endangered Species Act and is therefore, in full compliance with the Act. Because only marine (offshore) waters would be affected, no species under the jurisdiction of the U.S. Fish and Wildlife Service would be affected.

### 4.27.3 Fish and Wildlife Coordination Act of 1958

The Act, and its amendments, was established to assure that fish and wildlife resources have equal consideration with other values when planning water resources development projects. Coordination is not required because this project does not fall under the types of projects requiring coordination under the Act.

### 4.27.4 National Historic Preservation Act of 1966 (*inter alia*)

Consultation with the Florida State Historic Preservation Officer (SHPO) was initiated in August, 2011, and is ongoing in accordance with the National Historic Preservation Act of 1966, as amended, and as part of the requirements and consultation processes contained within the NHPA implementing regulations of 36 CFR 800. This project is also in compliance, through ongoing consultation, with the Archeological Resources Protection Act (96-95), the Abandoned Shipwreck Act of 1987 (PL 100-298; 43 U.S.C. 2101-2106); American Indian Religious Freedom Act (PL 95-341), Executive Orders (E.O) 11593, 13007, & 13175 and the Presidential Memo of 1994 on Government to Government Relations. Consultation is ongoing with the SHPO and appropriate federally recognized tribes.

### 4.27.5 Clean Water Act of 1972

As the proposed expansion areas are located outside of the jurisdictional limits of this Act, a Section 404(b) evaluation is not applicable to this project and was not prepared.

### 4.27.6 Clean Air Act of 1972

Designating an expanded ODMDS boundary does not cause any impacts to air quality. Air emissions associated with the projects utilizing the ODMDS are evaluated under the respective NEPA document for that project. No air quality permits would be required for this project.

### 4.27.7 Coastal Zone Management Act of 1972

A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this Draft EA as Appendix D. The State consistency review will be performed during the coordination of the draft EA. The State's final consistency determination will be included in the final EA.

### 4.27.8 Farmland Protection Policy Act of 1981

No prime or unique farmland would be impacted by implementation of this project. This act is not applicable.

### 4.27.9 Wild and Scenic River Act of 1968

No designated Wild and Scenic river reaches would be affected by project related activities. This act is not applicable.

#### 4.27.10 Marine Mammal Protection Act of 1972

Incorporation of the safe guards used to protect threatened and endangered species during disposal operations would protect any marine mammals in the area and not result in a "take;" therefore, this the designation is in compliance with the Act. As previously stated in Section 3.5.2, marine mammals are expected to be rare in the vicinity of the ODMDS with the exception of the bottlenose dolphin. USACE and USEPA do not anticipate the take of any marine mammal during any activities associated with the ODMDS designation or utilization. A trained and government-certified sea turtle and marine mammal observer will be stationed on hopper dredges during disposal operations. Appropriate actions will be taken to avoid marine mammal species during disposal operations. If a marine mammal is noted to be in the vicinity of disposal operations, the contractor will be advised to avoid interactions with the animal to the maximum extent practicable, while maintaining safe vessel operations.

#### 4.27.11 Estuary Protection Act of 1968

No designated estuary would be affected by project activities. This act is not applicable.

#### 4.27.12 Fishery Conservation and Management Act of 1976

The Draft EA was coordinated with the NOAA Fisheries. This project is in compliance with the Act.

#### 4.27.13 Submerged Lands Act of 1953

The project would not occur on submerged lands of the State of Florida. The project has been coordinated with the State and is in compliance with the act.

#### 4.27.14 Coastal Barrier Resources Act and Coastal Barrier Improvement Act of 1990

There are no designated coastal barrier resources in the project area that would be affected by this project. These acts are not applicable.

#### 4.27.15 Rivers and Harbors Act of 1899

The proposed work would not obstruct navigable waters of the United States. The proposed action has been subject to the public notice, public hearing, and other evaluations normally conducted for activities subject to the act. The project is in full compliance.

#### 4.27.16 Anadromous Fish Conservation Act

Anadromous fish species would not be affected. The project has been coordinated with the National Marine Fisheries Service and is in compliance with the Act.

#### 4.27.17 Migratory Bird Treaty Act and Migratory Bird Conservation Act

No migratory birds would be affected by project activities. The project is in compliance with these Acts.

#### 4.27.18 Marine Protection, Research and Sanctuaries Act

The MPRSA regulates the transportation and subsequent disposal of materials, including dredged materials, into ocean waters. The proposed ODMDS expansion is being designated pursuant to Section 102 of the MPRSA. The five general (40 CFR 228.5) and eleven specific (40 CFR 228.6) criteria for the selection of sites have been discussed and included in Section 2.6.

#### 4.27.19 Magnuson-Stevens Fishery Conservation and Management Act

Consultation will be initiated with NOAA Fisheries by USEPA with the Essential Fish Habitat Assessment included in Appendix C of this EA. This project will be fully coordinated under the Magnuson-Stevens Fishery Conservation and Management Act and therefore, in full compliance with the Act.

#### 4.27.20 E.O. 11990, Protection of Wetlands

No wetlands would be affected by project activities. This project is in compliance with the goals of this Executive Order.

#### 4.27.21 E.O. 11988, Flood Plain Management

This project does not occur in any floodplain, therefore, this Executive Order does not apply to project activities.

#### 4.27.22 E.O. 12898, Environmental Justice

The proposed activity would not result in adverse human health or environmental effects or exclude persons from participating in, deny persons the benefits of, or subject persons to discrimination because of their race, color, or natural origin. Further, the proposed activity would not impact “subsistence consumption of fish and wildlife.” The proposed project complies with this Executive Order.

#### 4.27.23 E.O. 13089, Coral Reef Protection

Executive Order 13089 (E.O. 13089) on Coral Reef Protection, signed by the President on June 11,1998, recognizes the significant ecological, social, and economic values provided by the Nation's coral reefs and the critical need to ensure that Federal agencies are implementing their authorities to protect these valuable ecosystems. E.O. 13089 directs Federal agencies, including USEPA and the USACE whose actions may affect U.S. coral reef ecosystems, to take the following steps:

1. Identify their actions that may affect U.S. coral reef ecosystems;
2. Utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and

3. To the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems.

It is the policy of USEPA and the USACE to apply their authorities under the MPRSA to avoid adverse impacts on coral reefs. Protection of coral reefs have been carefully addressed through the application the site designation criteria which require consideration of the potential site's location in relation to breeding, spawning, nursery, feeding, and passage areas of living marine resources and amenity areas (40 C.F.R. 228.6[a][2] and [3]), interference with recreation and areas of special scientific importance (40 C.F. R. 228.6[a][8]), and existence of any significant natural or cultural features at or in close proximity to the site (40 C.F.R. 228.6[a][11]) (see Section 2.6, Table 3). Based on application of these criteria and the analysis in Sections 3.5.2.2 and 4.4 of this EA, the proposed expansion sites should not have adverse effects on coral reefs.

#### 4.27.24 E.O. 13112, Invasive Species

The proposed action will not positively or negatively affect the status of invasive species.

# 5 LIST OF PREPARERS

## 5.1 PREPARERS

| Name | Discipline | Affiliation | Role |
|---|---|---|---|
| Christopher J. McArthur, P.E. | Marine Science/ Environmental Engineering | U.S. EPA Region 4 | Project Oversight/Environmental Assessment and Site Management an d Monitoring Plan |
| Kris Thoemke, Ph.D. | Marine Ecology | Coastal Engineering Consultants, Inc. | Project Manager, Environmental Assessment and Appendices |
| Michael Stephen, Ph.D. | Marine Geology/Coastal Processes | Coastal Engineering Consultants, Inc. | Project Oversight/Review EA |
| Cade E. Carter, Jr., P.E. | Civil/Environmental Engineering | GEC | EA Review/ Coordination |
| Donald W. Glenn III, Ph.D. | Environmental Engineering/Biology | GEC | Hardgrounds, Fish and Wildlife Resources, Environmental Effects |
| Donna Rogers, Ph.D. | Ecology | GEC | Environmental Assessment and Appendices |
| Joelle Verhagen | ODMDS Coordinator | USACE-SAJ | Environmental Assessment and Appendices |
| Aubree Hershorin, Ph.D. | Biologist | USACE-SAJ | Environmental Assessment and Appendices |
| Terri Jordan-Sellers | Biologist | USACE-SAJ | Environmental Assessment and Appendices |

## 5.2 REVIEWERS

| Name | Affiliation | Role |
| --- | --- | --- |
| Beth Walls | USEPA | NEPA Review |
| Christopher J. McArthur, P.E. | USEPA | Ocean Dumping Program Coordinator<br><br>EA, ESA and EFH Review |
| Duncan Powell | USEPA | ESA Review |
| Roland E. Ferry, Ph.D. | USEPA | EFH Review |
| Aubree Hershorin, Ph.D. | USACE | NEPA Review |
| Joelle Verhagen | USACE | ODMDS Coordinator |
| Terri Jordan-Sellers | USACE | NEPA; ESA and EFH Review |

# 6 PUBLIC INVOLVEMENT

## 6.1 SCOPING AND DRAFT EA

A scoping letter dated March 11, 2011 was issued for this action and a scoping meeting was held on March 31, 2011. This Draft EA will be made available to the public by notice of availability, and the mailing list is provided as Appendix A.

## 6.2 AGENCY COORDINATION

A Biological Assessment will be submitted to the NOAA Fisheries Protected Resource Division to coordinate for ESA species under their jurisdiction. An EFH Assessment will be submitted to NOAA Fisheries Habitat Conservation Division to coordinate on actions that may adversely affect EFH.

A Coastal Zone Consistency (CZC) Determination has been requested from Florida Department of Environmental Protection to ensure that the proposed federal project is consistent with Florida's Coastal Zone Management Act.

## 6.3 LIST OF RECIPIENTS

Copies of the Scoping Letter were mailed to the following parties:

*Federal Agencies*

- U.S. Environmental Protection Agency, Region 4, Wetlands & Marine Regulatory Section
- National Oceanic and Atmospheric Administration (NOAA) – National Marine Fisheries Service - Protected Resources Division and Habitat Conservation Division
- NOAA-National Ocean Service-Office of Coast Survey
- Naval Facilities Engineering Command (NAVFAC)
- US Coast Guard – Fort Lauderdale Station, District 7, and Sector Miami
- Department of the Interior
    - Bureau of Ocean Energy Management
    - U.S. Fish and Wildlife Service – Vero Beach Field Office

*State Agencies and Officials*

- Florida Department of Environmental Protection, Office of Intergovernmental Programs
- Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems
- Florida Department of Environmental Protection, Coastal and Aquatic Managed Areas (CAMA)
- Florida Fish and Wildlife Conservation Commission, Habitat and Species Conservation
- Honorable Bill Nelson, US Senate
- Honorable Marco Rubio, US Senate
- Honorable Debbie Wasserman Schultz, US Congress
- Mayor, City of Ft. Lauderdale
- Mayor, City of Hollywood
- Mayor, City of Hallandale

*Local Agencies, Businesses, and Organizations*

- Broward County Development and Environmental Regulation Division – Eric Myers
- Broward County Chairman of County Commissioners
- Port Everglades Pilot Association
- Nova Southeastern University - Institute of Marine & Coastal Studies
- Port Everglades Port Authority
- Crowley American Transport, Inc.
- Eller & Company
- Florida Sport Fishing Association
- Rinker Material Corporation
- Port Everglades Association, Inc.

## 6.4 COMMENTS RECEIVED AND RESPONSE

Comments received in response to the scoping meeting and any other agency coordination are included in Appendix A. All comments received in response to the public review of the Draft EA will be addressed, and a summary of the comments and the USACE response will be included in the Final EA.

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# APPENDIX A.

## PERTAINENT CORRESPONDENCE



**DRAFT ENVIRONMENTAL ASSESSMENT
ON THE
EXPANSION OF THE PORT EVERGLADES HARBOR
OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)
BROWARD COUNTY, FLORIDA**

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

MAR 11 2011

Planning and Environmental Branch

Dear Sir or Madam:

The US Army Corps of Engineers (Corps), Jacksonville District, and the US Environmental Protection Agency, Region 4 (EPA), are selecting a location for an expanded Port Everglades Ocean Dredged Material Disposal Site (ODMDS) in the Atlantic Ocean offshore of Ft. Lauderdale, Florida. The existing Port Everglades ODMDS was designated in 2005 and an EIS was prepared for the designation. Based on modeling results, the existing Port Everglades ODMDS does not have the capacity to accommodate anticipated levels of material from the proposed expansion at Port Everglades Harbor. As a result, USACE and EPA have determined the need for an expansion of the existing ODMDS. Continued use of the ODMDS is needed to meet future requirements for ocean disposal of dredged material from new work and routine maintenance of the Port Everglades Harbor and other users.

Corps and EPA are conducting applicable studies and are preparing an Environmental Assessment (EA) to provide the information necessary to evaluate alternatives and designate the expanded Port Everglades ODMDS pursuant to the National Environmental Policy Act of 1967 and Section 102 of the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972, as amended.

At this time, we are inviting agencies, interest groups, and the public to provide input on an array of alternatives and to identify significant resource concerns with the candidate configurations, details of which are included in the enclosed information package. Your comments will be incorporated during the preparation of the EA, used as vital insight into the expanded Port Everglades ODMDS, and retained for assistance in shaping the scope of future studies.

**Please provide written comments within 45 days from the date of this letter.**

EPA and Corps will hold a scoping meeting to offer further opportunity for input. Please join us at the following meeting time and location:

**6:00 – 8:00 PM**
**Thursday, March 31, 2011**
**West Lake Park Anne Kolb Nature Center**
**Mangrove Hall**
**751 Sheridan St.**
**Hollywood, Florida 33019**

If you are unable to attend in person and would like to join the meeting via teleconference, please RSVP to the U.S. Army Corps of Engineers.

Written comments should be addressed to the Corps or EPA at the following:

U.S. Army Corps of Engineers
Jacksonville District
Attention: Ms. April Patterson (CESAJ-PD-EC)
Post Office Box 4970
Jacksonville, FL 32232-0019
April.N.Patterson@usace.army.mil

U.S. Environmental Protection Agency
Region 4
(ATTN: Mr. Chris McArthur, Ocean Dumping Program Coordinator, Wetlands & Marine Regulatory Section)
61 Forsyth Street
Atlanta, Georgia 30303

If you have any questions concerning this meeting, please call Ms. Patterson, with the Corps, at (904) 232-2610.

Sincerely,

Kenneth R Dugger

for Eric P. Summa
Chief, Planning and Environmental Branch

Enclosure

# PORT EVERGLADES OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS) INFORMATION PACKAGE

**INTRODUCTION**: The disposal of dredged sediments from navigation channels and harbors onto the ocean floor can only be authorized at sites designated for that purpose. The US Army Corps of Engineers, Jacksonville District (USACE), and the US Environmental Protection Agency, Region 4 (USEPA), share the statutory responsibility for selection and management of these sites. The sites must be located and managed to ensure that ocean disposal of dredged material will not unreasonably degrade the marine environment or endanger human health, welfare, amenities, or economic potentialities. This information package summarizes some of the known issues associated expanding a new site offshore of Port Everglades Harbor in Ft. Lauderdale, Florida, and provides some insight into the detailed analysis that is used to determine where the expanded site should be located.

**EXISTING SITE:** The existing Port Everglades Ocean Dredged Material Disposal Site (ODMDS) is an approximately 1-square nautical mile ($nmi^2$) located approximately 4 nmi east-northeast of the Port Everglades Harbor (figure 1). This site is located on the upper continental slope on the western edge of the Florida Current and consists of primarily soft-bottom habitat in water depths of 195 to 215 meters (640 to 705 feet. The existing ODMDS was formally designated by the EPA in 2005. An Environmental Impact Statement was completed in 2004 in support of this original designation.

**NEED FOR INCREASED ODMDS CAPACITY:** Capacity modeling of the Port Everglades ODMDS using quantities projected by the current tentatively selected plan for construction at Port Everglades Harbor, area currents; and adjacent site bathymetry show the need for an expanded ODMDS. EPA and USACE are therefore initiating the process for expanding the existing Port Everglades ODMDS offshore Ft. Lauderdale, Florida.

**SITE AREA ALTERNATIVES:**

During the original site designation process, a number of alternatives were considered to help identify a disposal site that will be most economically feasible and least damaging to the environment. The screening technique for selecting the preferred location for the ODMDS involved a step-by-step elimination of unsuitable areas based on economic, operational, aesthetic, recreational, and environmental criteria until only acceptable areas for its location remained. Three acceptable alternative sites were considered for the original Port Everglades ODMDS designation based on the distance from the entrance to the port including the previously used 1.6-mile interim site, a 4-mile site and a 7-mile site. The EPA selected the 4-mile site as the preferred alternative and subsequently designated in 2005.

This federally designated 4-mile site is now under consideration for expansion. Two alternative expansion configurations were designed based on Automated Dredging and Disposal Alternatives Modeling System (ADDAMS) data, in addition to the required no action alternative.

No Action Alternative:
The No Action Alternative is defined as not designating an expansion of the Port Everglades ODMDS pursuant to Section 102 of the MPRSA. This would lead to continued use of the existing site for the placement of material from operations and maintenance dredging; and/or the emergency one time designation of a site by the Corps of Engineers under Section 102 of MPRSA for the dredged material generated by the proposed port expansion.

East-West Disposal Release Zone Alternative:
This configuration was designed based on an east-west oriented disposal release zone. This expanded configuration encompasses the existing ODMDS. It shares the same southern and eastern boarders and extends north and west to the red 1cm contour line (figure 2). This expanded site is approximately 4 square nautical miles.

North-South Disposal Release Zone Alternative:
This configuration was designed based on a north-south oriented disposal release zone. This expanded configuration encompasses the existing ODMDS. It shares the same southern and eastern boarders as the existing site and extends north and west to the blue 1 cm contour line (figure 3). This expanded site is approximately 4 square nautical miles.

Both alternate configurations are within the boundaries of previous surveys collected during the original site designation, as well as routine monitoring conducted by the EPA.

**PLAN OF ACTION:** USACE and EPA are proposing to designate an expanded ODMDS that incorporates the original ODMDS designated by EPA in 2005, in the Atlantic Ocean off Port Everglades Harbor. There are two possible site configurations and one no action option: The goal of the site selection process is to select a location which minimizes the risk of harm to the marine environment and human health and facilitates the necessary dredging and subsequent placement of dredged material. The site must meet selection criteria specified in EPA's Ocean Dumping Regulations. Compliance with the requirements of the National Environmental Policy Act is an integral part of the site designation process. The NEPA document will present information to evaluate the suitability of potential sites and disposal alternatives. It will be based on available information as well as new information collected and developed specifically for this site expansion and designation and will succinctly document the considerations made in selecting the ODMDS' specific configuration.

We are requesting comments and information from agencies, interest groups, and the public to identify significant resources within the proposed expansion alternatives and issues of concern. After receiving public and agency input through the scoping process, we will complete our information gathering plan, collect the required data, and prepare the NEPA and decision making documents. The public will have the opportunity to review the draft NEPA document, and make additional comments on the proposed expansion and designation.

**ISSUES:** EPA's Ocean Dumping Regulations contain environmental factors which must be considered in locating a dredged material disposal site in the ocean. As discussed previously, the goal is to position the site away from marine environments that are incompatible with use.

Based upon the analysis of the original site designation EIS and the issues presented in that document, the Corps and EPA believe that based upon the final site designation and subsequent monitoring of the site, the environmental issues of concern raised at the time of site designation have been resolved or addressed and do not rise to the level of significance at this time.

**ECONOMIC ANALYSIS:** The designated ODMDS is required by USACE policies and procedures to be located at an optimal distance from the dredging activity such that the socioeconomic analysis of benefits outweighs the costs. The economic analysis takes into account several different dredging scenarios over a 50-year project life horizon and compares the benefits and the costs of the dredging activities within that scenario. The feasibility analysis was conducted as part of the original site designation and is incorporated into this site expansion analysis.

**SITE CONFIGURATION:** The size, shape, and location of the site should facilitate the intended use and reduce the risk of user errors. The site configuration should allow management options such as placing materials from specific dredging locations in specific locations of the site. The site should be large enough to accommodate the anticipated quantities and types of dredged materials. Preliminary estimates indicate a site approximately 4 square nautical miles in size would be required for a 50-year analysis period based on proposed port expansion and historic maintenance dredging volumes.

**SCHEDULE:**

| | |
|---|---|
| Mail Scoping Letter | March 2011 |
| Hold Scoping Meeting | March 31, 2011 |
| Collect Site Specific Data | May 2011 |
| Publish Draft EA | October 2011 |
| Publish Final EA | April 2012 |
| Designate Site (Rulemaking) | September 2012 |

# MAILING LIST

## Federal Agencies

U.S. Environmental Protection Agency, Region 4, Wetlands & Marine Regulatory Section
National Oceanic and Atmospheric Administration (NOAA) – National Marine Fisheries Service
- Protected Resources Division
- Habitat Conservation Division

NOAA-National Ocean Service-Office of Coast Survey
Naval Facilities Engineering Command (NAVFAC) - Nancy Allen & Doug Garabini
US Coast Guard – Fort Lauderdale Station
Department of the Interior
- Bureau of Ocean Energy Management, Regulation and Enforcement
- U.S. Fish and Wildlife Service – Vero Beach Field Office

US Army Corps of Engineers – Regulatory Division - West Palm Beach Field Office

## State Agencies and Officials

Florida Department of Environmental Protection, Office of Intergovernmental Programs
Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems
Florida Department of Environmental Protection, Coral Reef Program
Florida Fish and Wildlife Conservation Commission

Honorable Bill Nelson, US Senate
Honorable Marco Rubio, US Senate
Honorable Debbie Wasserman Schultz, US Congress

Mayor, City of Ft. Lauderdale
Mayor, City of Hollywood
Mayor, City of Hallandale

## Local Agencies, Businesses, and Organizations

Broward County Development and Environmental Regulation Division – Eric Myers
Broward County Chairman of County Commissioners
Port Everglades Pilot Association
Nova Southeastern University - Institute of Marine & Coastal Studies
Port Everglades Port Authority
Crowley American Transport, Inc.
Eller & Company
Florida Sport Fishing Association
Rinker Material Corporation
Port Everglades Association, Inc.

Figure 1: **Port Everglades ODMDS Proposed Expansion Overview**

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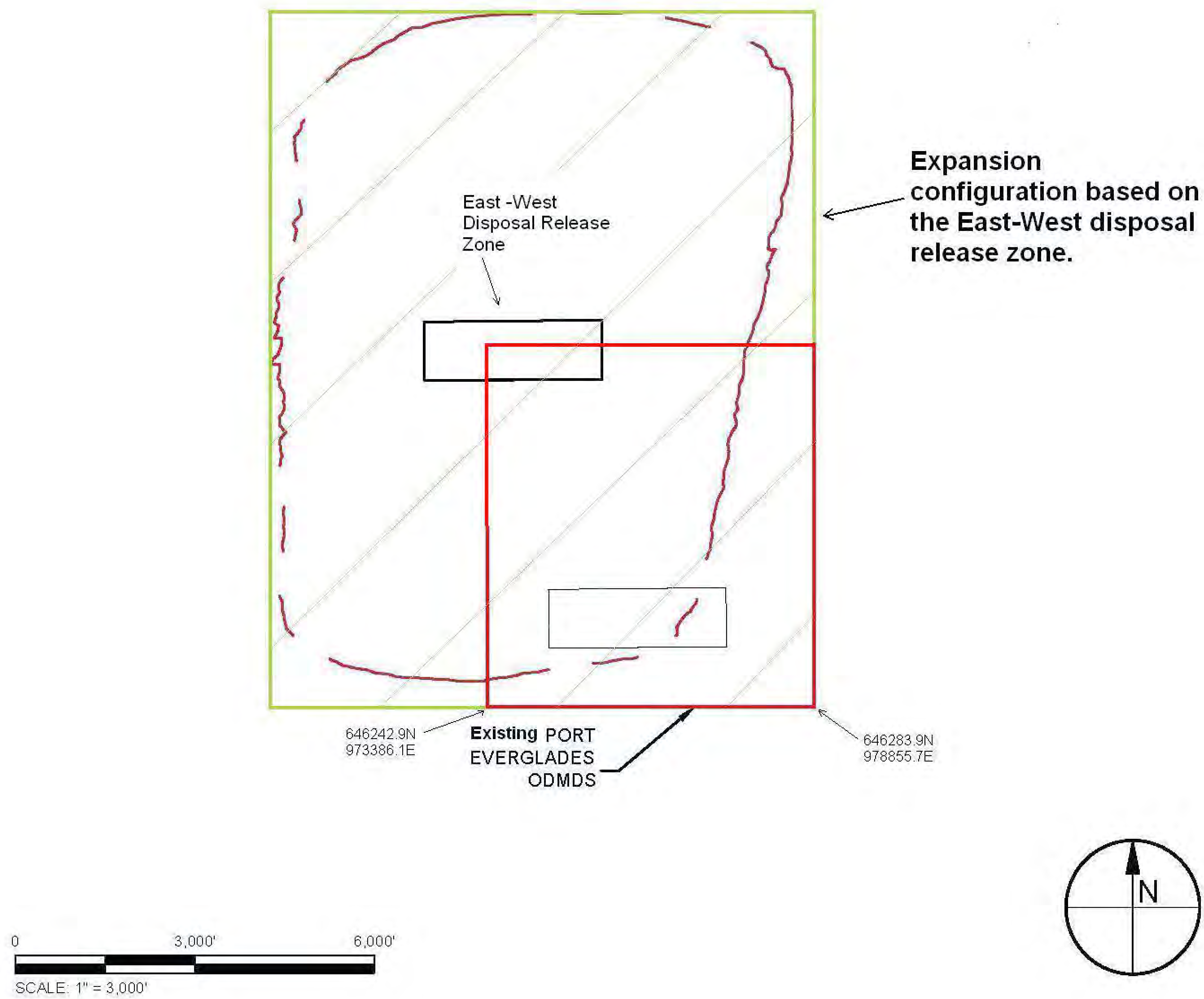


**Figure 2:**
**East-West Disposal Zone Configuration**

1 cm CONTOURS SIMULATIONS
PORT EVERGLADES ODMDS
BROWARD COUNTY, FLORIDA

DATE
NOVEMBER, 2010

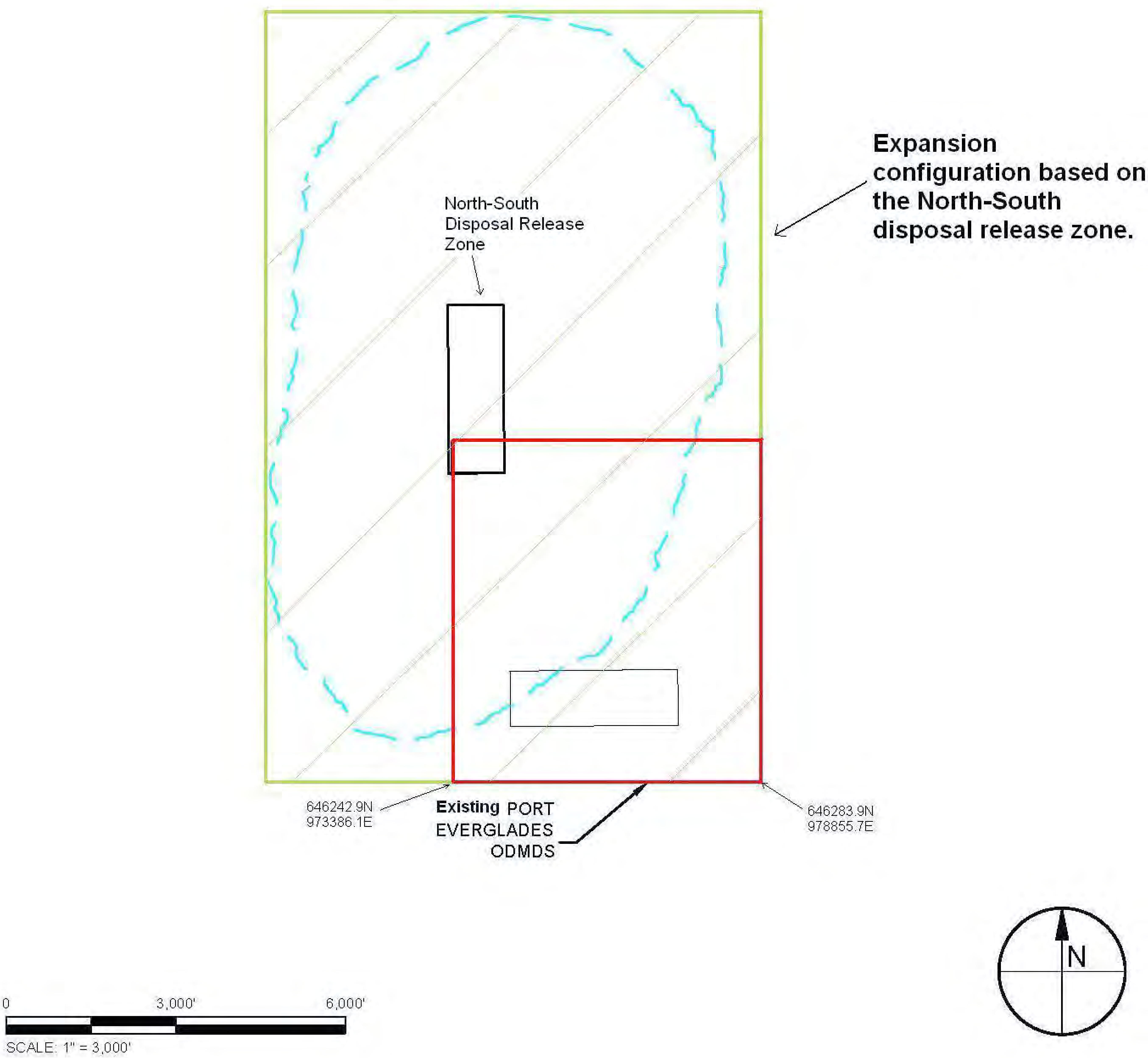


**Figure 3:**
**North-South Disposal Zone Configuration**

1 cm CONTOURS SIMULATIONS
PORT EVERGLADES ODMDS
BROWARD COUNTY, FLORIDA

DATE
NOVEMBER, 2010

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
(727) 824-5317; FAX (727) 824-5300
http://sero.nmfs.noaa.gov/

May 16, 2011 F/SER4:JK/pw

(Sent via Electronic Mail)

Jacksonville District, Department of the Army Corps of Engineers
Planning and Environmental Branch
PO Box 4970
Jacksonville, Florida 32232-0019
Attention: April Patterson, Project Manager

Environmental Protection Agency, Region 4
Wetlands and Marine Regulatory System
61 Forsyth Street
Atlanta, Georgia 30303
Attention: Mr. Chris McArthur, Ocean Dumping Program Coordinator

Dear Ms. Patterson and Mr. McArthur,

NOAA's National Marine Fisheries Service (NMFS) reviewed the letter from the Jacksonville District and Environmental Protection Agency (EPA) dated March 11, 2011, requesting views, comments, and information that may help the District and EPA prepare an Environmental Assessment (EA) for expansion of the Port Everglades Ocean Dredged Material Disposal Site (ODMDS). The District and EPA are examining expansion of the ODMDS because the existing ODMDS does not have the capacity to accommodate the material anticipated to come from the proposed expansion of Port Everglades Harbor. The following comments are from the Protected Resources Division (PRD) and Habitat Conservation Division (HCD) of the NMFS Southeast Regional Office. Comments and recommendations are provided pursuant to authorities of the Fish and Wildlife Coordination Act and Magnuson-Stevens Fishery Conservation and Management Act. NMFS PRD will also separately coordinate with the District and EPA under section 7 of the Endangered Species Act (ESA).

*Consultation History*

By email dated April 10, 2011, the District informed NMFS that it was completing the scope of work for a study within the ODMDS and requested NMFS provide relevant habitat information. By email dated April 11, 2011, NMFS provided the District and EPA with a summary of its coordination with Mr. John Reed from Harbor Branch Oceanographic Institute/Florida Atlantic University (HBOI/FAU) and Dr. Brain Walker, Dr. Charles Messing, and Dr. Richard Dodge from NOVA Southeastern University. The information NMFS provided identifies areas of possible hardbottom within the expansion area and the site of a potential shipwreck. NMFS also provided a technical report (Reed and Farrington 2010[1]) that

[1] Reed, J., and Farrington, S. 2010. Distribution of Deep-water Commercial Fisheries Species – Golden Crab, Tilefile, Royal Red Shrimp – in Deep-water Habitats off Eastern Florida from Submersible and ROV Dives, 163 pp.

documents blueline tilefish (*Caulolatilus microps*) in the project area. A summary of the information provided to the District and EPA appears in this letter.

By email dated April 18, 2011, the District and EPA provided NMFS with a draft survey plan. On April 19, 2011, NMFS participated in a teleconference with the District and EPA regarding the habitat maps that were available and the methods proposed for the survey scheduled to occur May 3 to 6, 2011. NMFS expressed a preference for use of a remotely operated vehicle (ROV) to map and characterize the hardbottom in the expansion area. The District and EPA advised that the survey for hardbottom would be limited to sediment grabs, sediment profile imagery, and otter trawls. The District noted that a separate archaeological resource survey would be conducted at a later date. In the case that the archaeological survey methods include use of an ROV, the District and EPA indicated it may be feasible to include transects over areas suspected to be hardbottom. NMFS advised that unsuccessful sediment grabs or sediment camera penetrations may indicate presence of hardbottom; NMFS also advised that otter trawling not be conducted over areas suspected to be hardbottom.

*Summary of Available Habitat Information Provided to the District and EPA on April 11, 2011*
Mr. John Reed (HBOI/FAU) provided an overlay of the ODMDS location and results from surveys associated with evaluations of the Calypso Pipeline (SAJ-2001-2115) and Calypso Deepwater Port (USCG Docket No. 2006-26009) (Figure 1). Within the upper corner of the proposed ODMDS expansion area is a red star that indicates the location of a potential shipwreck discovered during the ROV survey for the Calypso Port; tilefish also were documented at that location. While the overlap of the Calypso Port survey and the ODMDS expansion area is primarily soft bottom, there is a small overlap area with the Calypso Pipeline survey that depicts hardbottom in the ODMDS expansion area. Along this area, NOVA scientists observed boulders 1 to 2 feet in diameter, anemones, sponges, hydroids, and mud bottom with signs of bioturbation. NOVA scientists also indicated hardbottom occurs inside the proposed ODMDS expansion area. Seafloor bathymetric imaging shows large areas likely to be variable, low-relief surface inside the present ODMDS and the proposed expansion area (yellow circles, Figure 2). The areas shown in pink are identified as rubble with anemones, brittle stars, and crabs. The NOVA scientists conclude that more detailed investigation of the biological communities would be useful before a determination is made on the proposed ODMDS expansion.

*Essential Fish Habitat within the Project Area*
Deepwater hardbottom and soft bottom habitats within and in close proximity to the ODMDS expansion areas are designated Essential Fish Habitat (EFH) for species managed under the snapper-grouper, golden crab, and shrimp fishery management plans. Species with affinity for these habitat types and observed in or near the project area include blueline and golden tilefish (*Lopholatilus chamaeleonticeps*) (Reed and Farrington 2010). The District and EPA indicate that the water depths of the proposed ODMDS expansion area are approximately 150 to 215 meters.[2] Golden tilefish are generally found in depths of 80-540 meters, but most commonly found in 200-meter depths. Golden tilefish have an affinity for habitats that may be present in the proposed expansion area, including irregular bottom comprised of troughs and terraces inter-mingled with sand, mud, or shell hash bottom; and mud-clay bottoms in depths of 150 to 300 meters. Blueline tilefish also have an affinity for habitat that may be in the proposed expansion area, including the upper slope along the 100-fathom contour (150-225 meters); hardbottom habitats characterized as rock overhangs, rock outcrops, manganese-phosphorite rock slab formations. Additionally, offshore, unconsolidated bottom, including ripple habitat, dunes, soft bioturbated habitat, in addition to low relief outcrops are EFH for golden crab (*Chaceon fenneri*).

[2] The letter states the existing ODMDS is 195 to 215 meters and the graphic provided as Figure 1 with the letter depicts the 100 fathom contour line intersecting the western boundary of the proposed expansion area.

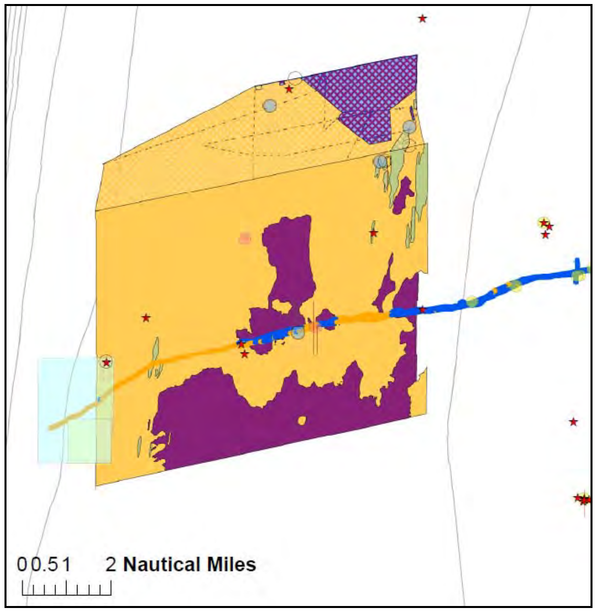


Figure 1. Light blue = existing ODMDS and proposed expansion area; tan polygons and lines = soft bottom; dark blue = rock or hardbottom; red = high profile coral habitat; red stars = tilefish; red star in the upper right corner of the ODMDS is a possible shipwreck. Figure provided by Mr. John Reed (HBOI/FAU).

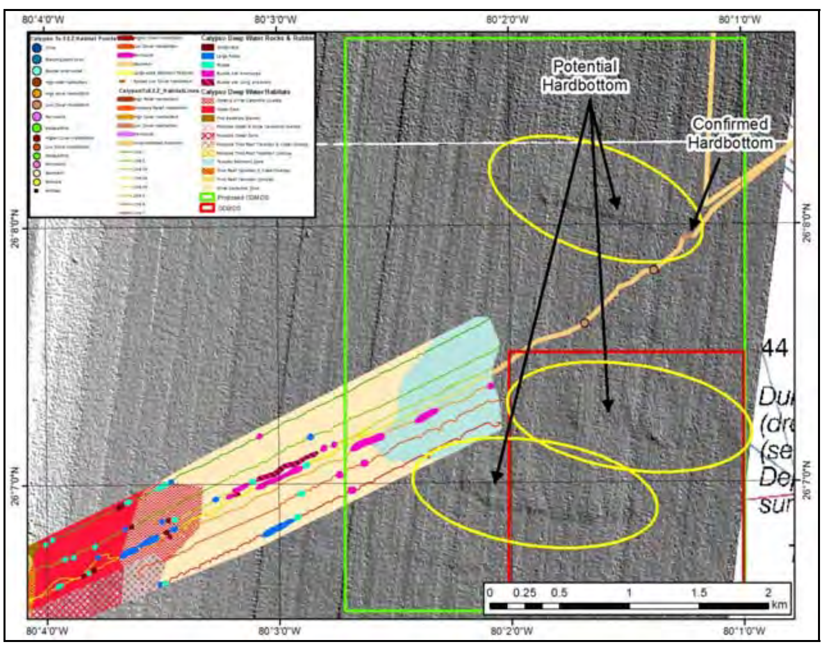


Figure 2: Variable relief in bathymetry and incidences of hardbottom occurrences along ROV transects indicate three large areas on potential hardbottom near with the existing ODMDS and proposed expansion area (circled in yellow). Pink areas depict areas of rubble. Figure provided by Dr. Brian Walker (NOVA)

*Essential Fish Habitat Consultation Requirements*
NMFS recommends that the District and EPA continue to coordinate closely with HCD to ensure the EFH assessment and NEPA documents contain sufficient detail for a final determination (please see 50 CFR 600.10 to 600.920 for details on EFH definitions and EFH assessments). NMFS recommends the EFH assessment include the results of an on-site inspection and detailed investigation of the potential hardbottom habitats, including features identified in Figures 1 and 2. Unavoidable direct or indirect impacts to EFH will require compensatory mitigation.

*Threatened and Endangered Species that May Occur at the Expanded ODMDS*
Based on the limited information provided, NMFS believes the following ESA-listed species may occur at the existing ODMDS and within the area proposed for expansion: smalltooth sawfish (*Pristis pectinata*), loggerhead (*Caretta caretta)*, Kemp's ridley (*Lepidochelys kempii*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea)*, and hawksbill sea turtles (*Eretmochelys imbricata)*. Other ESA-listed species that may occur in the project area include North Atlantic right whale (*Eubalaena glacialis*), sperm whale (*Physeter macrocephalus*), sei whale (*Balaenoptera borealis*), fin whale (*Balaenoptera physalus*), blue whale (*Balaenoptera musculus*), and humpback whale (*Megaptera novaeangliae*).

*Endangered Species Act Consultation Requirements and Biological Assessments*
Section 7 of ESA requires federal agencies to consult with NMFS if their activities may affect ESA-listed species or designated critical habitat. If ESA-listed species or critical habitat may be present in the action area, a biological assessment (BA) is required. By regulation, a BA is prepared for "major construction activities" defined as a construction project which is "a major federal action significantly affecting the quality of the human environment" (as defined by NEPA of 1969, 42 U.S.C. 4332(2)(C)).

Enclosed please find NMFS' Recommendations for the Contents of Biological Assessments (BAs) and Biological Evaluations (BEs). We suggest using the enclosed recommendations if you plan to submit a BA or BE. The BA or BE may be submitted as a stand-alone document or included as a distinct section of the EA. The enclosed recommendations should also assist the District and EPA in making their effect determinations (please see page 4 of the enclosed recommendations). In addition, we have enclosed a list of species under the jurisdiction of NMFS that are found off the Atlantic coast of Florida. This list is intended to serve as a guide. It does not mean that all of the species on the list may be present in the project area; however, some of the species on the list (e.g., sea turtles, smalltooth sawfish, and ESA-listed whales) may be present in the project area. Please advise whether District or EPA will serve as the lead action agency for the ESA Section 7 Consultation.

*Closing*
Thank you for the opportunity to provide comments. Related correspondence with NMFS HCD should be directed to Ms. Jocelyn Karazsia at our West Palm Beach office, which is co-located with the US Environmental Protection Agency at USEPA, 400 North Congress Avenue, Suite 120, West Palm Beach, Florida, 33401. She may be reached by at Jocelyn.Karazsia@noaa.gov or (561) 616-8880, extension 207. Related correspondence with NMFS PRD should be directed to Ms. Audra Livergood, she may be reached at Audra.Livergood@noaa.gov or by telephone at (954) 356-7100.

Sincerely,

Pace Willer

/ for

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

Enclosures:
NMFS' Recommendations for the Contents of Biological Assessments and Biological Evaluations
List of species under NMFS jurisdiction that are found off the Atlantic coast of Florida

cc:
FWS, Jeffrey_Howe@fws.gov
FWCC, Lisa.Gregg@MyFWC.com, Ron.Mezich@MyFWC.com
FDEP, Merrie.Neely@dep.state.fl.us, Vladimir.Kosmynin@dep.state.fl.us
FDEP, Debby.Tucker@dep.state.fl.us, Shana.Kinsey@dep.state.fl.us
EPA, Miedema.Ron@epa.gov
SAFMC, Roger.Pugliese@safmc.net
F/SER3, Audra.Livergood@noaa.gov
F/SER4, David.Dale@noaa.gov, Jocelyn.Karazsia@noaa.gov

National Marine Fisheries Service
Recommendations for the Contents of
Biological Assessments and Biological Evaluations
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When preparing a Biological Assessment (BA) or Biological Evaluation (BE), keep in mind that the people who read or review this document may not be familiar with the project area or what is proposed by the project. Therefore your BA or BE should present a clear line of reasoning that explains the proposed project and how you determined the effects of the project on each threatened or endangered species, or critical habitat, in the project area. Try to avoid technical jargon not readily understandable to people outside your agency or area of expertise. Remember, this is a **public document**. Some things to consider and, if appropriate, to include in your BA or BE, follow.

**1. What is the difference between a Biological Evaluation and a Biological Assessment?**

By regulation, a Biological Assessment is prepared for "major construction activities" — defined as "a construction project (or other undertaking having similar physical effects) which is a major Federal action significantly affecting the quality of the human environment (as referred to in the National Environmental Policy Act of 1969 (NEPA) [(42 U.S.C. 4332(2)(C)])." A BA is required if listed species or critical habitat may be present in the action area. A BA also may be recommended for other activities to ensure the agency's early involvement and increase the chances for resolution during informal consultation. Recommended contents for a BA are described in 50 CFR 402.12(f).

Biological Evaluation is a generic term for all other types of analyses in support of consultations. Although agencies are not required to prepare a Biological Assessment for non-major construction activities, **if a listed species or critical habitat is likely to be affected, the agency must provide the Service with an evaluation on the likely effects of the action.** Often this information is referred to as a BE. The Service uses this documentation along with any other available information to decide if concurrence with the agency's determination is warranted. Recommended contents are the same as for a BA, as referenced above.

The BAs and BEs should not be confused with Environmental Assessments (EA) or Environmental Impact Statements (EIS) which may be required for NEPA projects. These EAs and EISs are designed to provide an analysis of multiple possible alternative actions on a variety of environmental, cultural, and social resources, and often use different definitions or standards. However, if an EA or EIS contains the information otherwise found in a BE or BA regarding the project and the potential impacts to listed species, it may be submitted in lieu of a BE or BA.

**2. What are you proposing to do?**

Describe the project. A project description will vary, depending on the complexity of the project. For example, describing the construction or removal of a fixed aid-to-navigation in the Intracoastal Waterway, or the abandonment/dismantling of an oil-producing-platform may be relatively simple, but describing a the extent and amplitude of potential impacts of military training exercises involving different military assets, combinations of weaponry, locations, and seasons would necessarily be more detailed and complex. Include figures and tables if they will help others understand your proposed action and its relationship with the species' habitat.

How are you (or the project proponent) planning on carrying out the project? What tools or methods may be used? How will the site be accessed? When will the project begin, and how long will it last?

Describe the "action area" (all areas to be affected directly or indirectly by the Federal action and not merely the immediate areas involved in the action [50 CFR 402.02]). Always include a map (topographic maps are particularly helpful). Provide photographs including aerials, if available. Describe the project area (i.e., topography, vegetation, condition/trend).

Describe current management or activities relevant to the project area. How will your project change the area?

Supporting documents are very helpful. If you have a blasting plan, best management practices document, sawfish/sea turtle/sturgeon conservation construction guidelines, research proposal, NEPA or other planning document or any other documents regarding the project, attach them to the BA or BE.

**3. What threatened or endangered species, or critical habitat, may occur in the project area?**

A request for a species list may be submitted to the Service, or the Federal action agency or its designated representative may develop the list. If you have information to develop your own lists, the Service should be contacted periodically to ensure that changes in species' status or additions/deletions to the list are included. Sources of biological information on federally-protected sea turtles, sturgeon, Gulf sturgeon (and Gulf sturgeon critical habitat), and other listed species and candidate species can be found at the following website addresses: NMFS Southeast Regional Office, Protected Resources Division (http://sero.nmfs.noaa.gov/pr/protres.htm); NMFS Office of Protected Resources (http://www.nmfs.noaa.gov/pr/species); U.S. Fish and Wildlife Service (http://noflorida.fws.gov/SeaTurtles/seaturtle-info.htm); http://www.nmfs.noaa.gov/pr/; http://www.sad.usace.army.mil/protected%20resources/turtles.htm; http://endangered.fws.gov/wildlife.html#Species; the Ocean Conservancy (http://www.cmc-ocean.org/main.php3); the Caribbean Conservation Corporation (http://www.cccturtle.org/); Florida Fish and Wildlife Conservation Commission (http://floridaconservation.org/psm/turtles/turtle.htm); http://www.turtles.org; http://www/seaturtle.org; http://alabama.fws.gov/gs/; http://obis.env.duke.edu/data/sp_profiles.php; www.mote.org/~colins/Sawfish/SawfishHomePage.html; www.floridasawfish.com; http://www.flmnh.ufl.edu/fish/Sharks/sawfish/srt/srt.htm; www.flmnh.ufl.edu/fish/sharks/InNews/sawprop.htm; also, from members of the public or academic community, and from books and various informational booklets. Due to budget constraints and staff shortages, we are only able to provide general, state-wide, or country-wide (territory-wide) species lists.

**Use your familiarity** with the project area when you develop your species lists. Sometimes a species may occur in the larger regional area near your project, but the habitat necessary to support the species is not in the project area (including areas that may be beyond the immediate project boundaries, but within the area of influence of the project. If, for example, you know that the specific habitat type used by a species does not occur in the project area, it does not need to appear on the species list for the project. However, documentation of your reasoning is helpful for Service biologists or anyone else that may review the document.

**4. Have you surveyed for species that are known to occur or have potential habitat in the proposed project area?**

The "not known to occur here" approach is a common flaw in many BA/BEs. The operative word here is "known." Unless adequate surveys have been conducted or adequate information sources have been referenced, this statement is difficult to interpret. It begs the questions "Have you looked?" and "How have you looked?" Always reference your information sources.

Include a clear description of your survey methods so the reader can have confidence in your results. Answer such questions as:

How intensive was the survey? Did you look for suitable habitat or did you look for individuals? Did the survey cover the entire project area or only part of it? Include maps of areas surveyed if appropriate.

Who did the surveys and when? Was the survey done during the time of year/day when the plant is growing or when the animal can be found (its active period)? Did the survey follow accepted protocols?

If you are not sure how to do a good survey for the species, the Service recommends contacting species experts. Specialized training is required before you can obtain a permit to survey for some species.

*Remember that your evaluation of potential impacts from a project does not end if the species is/are not found in the project area. You must still evaluate what effects would be expected to the habitat, even if it is not known to be occupied, because impacts to habitat that may result indirectly in death or injury to individuals of listed species would constitute "take".*

**5. Provide background information on the threatened or endangered species in the project area.**

Describe the species in terms of overall range and population status. How many populations are known? How many occur in the project area? What part of the population will be affected by this project? Will the population's viability be affected? What is the current habitat condition and population size and status? Describe related items of past management for the species, such as stocking programs, habitat improvements, or loss of habitat or individuals caused by previous projects.

6. **How will the project affect the threatened or endangered species or critical habitat that occur in the project area?**

If you believe the project will not affect the species, explain why. Effects analyses must include evaluating whether adverse impacts to species' habitats, whether designated or not, could indirectly harm or kill listed species.

If you think the project may affect the species, explain what the effects might be. The Endangered Species Act requires you consider all effects when determining if an action funded, permitted, or carried out by a Federal agency may affect listed species. Effects you must consider include direct, indirect, and cumulative effects. Effects include those caused by interrelated and interdependent actions, not just the proposed action. Direct effects are those caused by the action and occur at the same time and place as the action. Indirect effects are caused by the action and are later in time but are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no significant independent utility apart from the action under consideration. Interrelated or interdependent actions can include actions under the jurisdiction of other federal agencies, state agencies, or private parties. Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal actions subject to consultation.

Describe measures that have or will be taken to avoid or eliminate adverse effects or enhance beneficial effects to the species. Refer to conversations you had with species experts to achieve these results.

Consider recovery potential if the project area contains historic range for a species.

Evaluate impacts to designated critical habitat areas by reviewing any project effects to the physical or biological features essential to the conservation of the species.

**7. What is your decision? The Federal action agency must make a determination of effect.**

Quite frequently, effect determinations are not necessarily *wrong;* they simply are not justified in the assessment. The assessment should lead the reviewer through a discussion of effects to a logical, well-supported conclusion. Do not assume that the Service biologist is familiar with the project and/or its location and that there is no need to fully explain the impact the project may have on listed species. If there is little or no connection or rationale provided to lead the reader from the project description to the effect determination, we cannot assume conditions that are not presented in the assessment. Decisions must be justified biologically. The responsibility for making and supporting the determination of effect falls on the Federal action agency; however, the Service cannot merely "rubber stamp" the action agency's determination and may ask the agency to revisit its decision or provide more data if the conclusion is not adequately supported by biological information.

You have three choices for each listed species or area of critical habitat:

1. "No effect" is the appropriate conclusion when a listed species will not be affected, either because the species will not be present or because the project does not have any elements with the potential to affect the species. "No effect" does not include a *small* effect or an effect that is *unlikely* to occur: if effects are insignificant (in size) or discountable (extremely unlikely), a "may affect, but not likely to adversely affect" determination is appropriate. A "no effect" determination does **not** require written concurrence from the Service and ends ESA consultation requirements unless the project is subsequently modified in such manner that effects may ensue.

2. "May affect - is not likely to adversely affect" (NLAA) means that all effects are either beneficial, insignificant, or discountable. Beneficial effects have concurrent positive effects without any adverse effects to the species or habitat (i.e., there cannot be "balancing," wherein the benefits of the project would be expected to outweigh the adverse effects - see #3 below). Insignificant effects relate to the magnitude or extent of the impact (i.e., they must be small and would not rise to the level of a take of a species). Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. A "NLAA" determination by the action agency requires **written** concurrence from the Service.

3. "May affect - is likely to adversely affect" means that all adverse effects cannot be avoided. A combination of beneficial and adverse effects is still "likely to adversely affect," even if the net effect is neutral or positive. Adverse effects do not qualify as discountable simply because we are not certain they will occur. The probability of occurrence must be extremely small to achieve discountability. Likewise, adverse effects do not meet the definition of insignificant because they are less than major. If the adverse effect can be detected in any way or if it can be meaningfully articulated in a discussion of the results, then it is not insignificant, it is likely to adversely affect. This requires formal consultation with the Service.

A fourth finding is possible for proposed species or proposed critical habitat:

4. "Is likely to jeopardize/destroy or adversely modify proposed species/critical habitat" is the

appropriate conclusion when the action agency identifies situations in which the proposed action is likely to jeopardize a species proposed for listing, or destroy or adversely modify critical habitat proposed for designation. If this conclusion is reached, conference is required.

List the species experts you contacted when preparing the BE or BA but avoid statements that place the responsibility for the decision of “may affect” or “no effect” on the shoulders of the species experts. Remember, this decision is made by the Federal action agency.

Provide supporting documentation, especially any agency reports or data that may not be available to the Service. Include a list of literature cited.

Originally prepared: January 1997
U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office

Revised: January 2006
National Marine Fisheries Service
Protected Resources Division
263 13th Avenue South
St. Petersburg, FL 33701
(727) 824-5312

**OUTLINE EXAMPLE FOR A**
**BIOLOGICAL ASSESSMENT OR BIOLOGICAL EVALUATION**

Cover Letter **- VERY IMPORTANT -** Include purpose of consultation, project title, and consultation number (if available). A determination needs to be made for each species and for each area of critical habitat. You have three options: 1) a "no effect" determination; 2) request concurrence with an "is not likely to adversely affect" determination; 3) make a "may affect, is likely to adversely affect" determination, and request "formal" consultation. If proposed species or critical habitat are included, state whether the project is likely to result in jeopardy to proposed species, or the destruction or adverse modification of proposed critical habitat. If the critical habitat is divided into units, specify which critical habitat unit(s) will be affected.

Attached to Cover Letter: Biological Assessment or Biological Evaluation document, broken down as follows:

Title: e.g., BA (or BE) for "Project X"; date prepared, and by whom.

A. Project Description - Describe the proposed action and the action area. Be specific and quantify whenever possible.

For Each Species:
1. Description of affected environment (quantify whenever possible)
2. Description of species biology
3. Describe current conditions for each species
    a. Range-wide
    b. In the project area
    c. Cumulative effects of State and private actions in the project area
    d. Other consultations of the Federal action agency in the area to date
4. Describe critical habitat (if applicable)
5. Fully describe effects of proposed action on each species and/or critical habitat, and species' response to the proposed action.
    a. Direct effects
    b. Indirect effects
    c. Interrelated and interdependent actions
    d. Potential incidental take resulting from project activities

Factors to be considered/included/discussed when analyzing the effects of the proposed action on each species and/or critical habitat include: 1) Proximity of the action to the species, management units, or designated critical habitat units; 2) geographic area(s) where the disturbance/action occurs); timing (relationship to sensitive periods of a species' lifecycle; 3) duration (the effects of a proposed action on listed species or critical habitat depend largely on the duration of its effects); 4) disturbance frequency (the mean number of events per unit of time affects a species differently depending on its recovery rate); 5) disturbance intensity (the effect of the disturbance on a population or species as a function of the population or species' state after the disturbance); 6) disturbance severity (the effect of a disturbance on a population or species or habitat as a function of recovery rate – i.e., how long will it take to recover)

6. Conservation Measures (protective measures to avoid or minimize effects for each species)
7. Conclusions (effects determination for each species and critical habitat)
8. Literature Cited
9. Lists of Contacts Made/Preparers
10. Maps/Photographs

**Guidance on Preparing an Initiation Package for Endangered Species Consultation**

This document is intended to provide general guidance on the type and detail of information that should be provided to initiate consultation with U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS). This is not intended to be an exhaustive document as specific projects may require more or less information in order to initiate consultation. Also, note that this contains guidance on the information required to initiate formal consultation procedures with USFWS and/or NMFS. Additional information needs may be identified during consultation. Texts in italics below are examples. Normal text is guidance. A glossary of terms is appended.

## INTRODUCTION

Here is an example of introductory language:

*The purpose of this initiation package is to review the proposed [project name] in sufficient detail to determine to what extent the proposed action may affect any of the threatened, endangered, proposed species and designated or proposed critical habitats listed below. In addition, the following information is provided to comply with statutory requirements to use the best scientific and commercial information available when assessing the risks posed to listed and/or proposed species and designated and/or proposed critical habitat by proposed federal actions. This initiation package is prepared in accordance with legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act (50 CFR 402; 16 U.S.C. 1536 (c)).*

### Threatened, Endangered, Proposed Threatened or Proposed Endangered Species

Example language:

*The following listed and proposed species may be affected by the proposed action:*

*common name (Scientific name)* ***T***

*common name (Scientific name)* ***E***

*common name (Scientific name)* ***PT***

*common name (Scientific name)* ***PE***

This list should include all of the species from the species lists you obtained from USFWS and NMFS. If it doesn't, include a brief explanation here and a more detailed explanation in your record to help USFWS, NMFS and future staff understand your thought process for excluding a species from consideration.

### Critical Habitat

Example language:

*The action addressed within this document falls within Critical Habitat for [identify species].*

## CONSULTATION TO DATE

"Consultation" under the ESA consists of discussions between the action agency, the applicant (if any), and USFWS and/or NMFS. It is the sharing of information about the proposed action and related actions, the species and environments affected, and means of achieving project purposes while conserving the species and their habitats. Under the ESA, consultation can be either informal or formal. Both processes are similar, but informal consultation may result in formal consultation if there is a likelihood of unavoidable take. Formal consultation has statutory timeframes and other requirements (such as the submission of the information in this package and a written biological opinion by USFWS or NMFS).

Summarize any consultation that has occurred thus far. Identify when consultation was requested (if not concurrent with this document). Be sure to summarize meetings, site visits and correspondence that were important to the decision-making process.

## DESCRIPTION OF THE PROPOSED ACTION

The purpose of this section is to provide a clear and concise description of the proposed activity and any interrelated or interdependent actions.

The following information is necessary for the consultation process on an action:

1. The action agency proposing the action.

2. The authority(ies) the action agency will use to undertake, approve, or fund the action.

3. The applicant, if any.

4. The action to be authorized, funded, or carried out.

5. The location of the action.

5. When the action will occur, and how long it will last.

6. How the action will be carried out

7. The purpose of the action.

8. Any interrelated or interdependent actions, or that none exist to the best of your knowledge.

Describe and specify: **WHO** is going to do the action and under what authority, include the name and office of the action agency and the name and address of the applicant; **WHAT** the project or action is; **WHERE** the project is (refer to attached maps); **WHEN** the action is going to take place, including time line and implementation schedules; **HOW** the action will be accomplished, including the various activities that comprise the whole action, the methods, and the types of equipment used; **WHY** the action is proposed, including its purpose and need; and **WHAT OTHER** interrelated and interdependent actions are known. This combination of actions are what is being consulted on for the 7(a)(2) analysis.

Include a clear description of all conservation measures and project mitigation such as avoidance measures, seasonal restrictions, compensation, restoration/creation (on-site and in-kind, off-site and in-kind, on-site and out-of-kind, off-site and out-of-kind), and use of mitigation or conservation banks.

Here are some examples of commonly overlooked items to include in your project description:

Type of project

Project location

Project footprint

Avoidance areas

Start and end times

Construction access

Staging/laydown areas

Construction equipment and techniques

Habitat status on site

Habitat between work areas and endangered species locations

Permanent vs. temporary impacts

Surrounding land-use

Hydrology and drainage patterns

Duration of “temporary” impacts

Prevailing winds and expected seasonal shifts

Restoration areas

Conservation measures

Compensation and set-asides

Bank ratios and amounts

Mitigation: what kind and who is responsible?

Dust, erosion, and sedimentation controls

Whether the project is growth-inducing or facilitates growth

Whether the project is part of a larger project or plan

What permits will need to be obtained

**Action Area**

Describe all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. This includes any interrelated and interdependent actions. Remember that the action area is not based simply on the Federal action and should not be limited to the location of the Federal action. The same applies to the applicant’s action. The action area is defined by measurable or detectable changes in land, air and water, or to other measurable factors that may elicit a response in the species or critical habitat.

To determine the action area, we recommend that you first break the action down into its components (*e.g.,* vegetation clearing, construction of cofferdams, storage areas, borrow areas, operations, maintenance, etc.,) to assess the potential impacts resulting from each component.

Determine the impacts that are expected to result from each component. For example, instream actions may mobilize sediments that travel downstream as increased turbidity and then settle out as sediments on the stream substrate. Sound levels from machinery may be detectable hundreds of feet, thousands of feet, or even miles away. Use these distances when delineating the extent of your action area. Note: don’t forget to subsequently reconstruct the action to assess the combined stressors of the components. You may find that some stressors are synergistically minimized or avoided, whereas other stressors may increase.

Finally, describe the action area, including features and habitat types. Include photographs and an area map as well as a vicinity map. The vicinity map for terrestrial projects should be at a 1:24,000 scale with the USGS quad name included.

## SPECIES ACCOUNTS AND STATUS OF THE SPECIES IN THE ACTION AREA

Provide local information on affected individuals and populations, such as presence, numbers, life history, etc. Identify which threats to the species’ persistence identified at the time of listing are likely to be present in the action area. Identify any additional threats that are likely to be present in the action area.

If the species has a distribution that is constrained by limiting factors, identify where in the action area factors are present that could support the species and where they are absent or limiting. For example, if a species is limited to a narrow thermal range and a narrow humidity range, show where in the action area the temperatures are sufficient to support the species, where the humidity is sufficient to support the species, and where those areas overlap.

Include aspects of the species' biology that relate to the impact of the action, such as sensitivity to or tolerance of: noise, light, heat, cold, inundation, smoke, sediments, dust, etc. For example, if the species is sensitive to loud sounds or vibration, and your project involves loud tools or equipment, reference that aspect of their biology. Include citations for all sources of information

Describe habitat use in terms of breeding, feeding, and sheltering. Describe habitat condition and habitat designations such as: critical habitat (provide unit name or number, if applicable), essential habitat, important habitat, recovery area, recovery unit (provide unit name or number, if applicable). Also discuss habitat use patterns, including seasonal use and migration (if relevant), and identify habitat needs.

Identify and quantify the listed-species habitat remaining in the action area. GIS layers are useful here, as are land ownership patterns--especially local land trusts and open space designations.

Identify any recovery plan implementation that is occurring in the action area, especially priority one action items from recovery plans.

Include survey information. For all monitoring and survey reports, please clearly identify how it was done, when, where, and by whom. If survey protocols were followed, reference the name and date of the protocol. If survey protocols were modified, provide an explanation of how the surveying occurred and the reasoning for modifying the protocol.

Keep it relevant. It is unnecessary to discuss biology that is totally unrelated to project impacts--*e.g.*, discussion of pelage color, teat number, and number of digits fore and aft when the project is a seasonal wetland establishment.

Utilize the best scientific and commercial information available. Use and cite recent publications/journal articles/agency data and technical reports. Include local information, relative to the action area, views of recognized experts, results from recent studies, and information on life history, population dynamics, trends and distribution. Reference field notes, unpublished data, research in progress, etc.

Things to consider:

Existing threats to species

Fragmentation

Urban growth area

Drainage patterns

Information on local sightings and populations

Population trends

Home range and dispersal

Sensitivity of endangered species to: dust, noise, head, desiccation, etc.

Trap stress/mortality

Predators

## ENVIRONMENTAL BASELINE AND CUMULATIVE EFFECTS

Provide information on past, present and future state, local, private, or tribal activities in the action area: specifically, the positive or negative impacts those activities have had on the species or habitat in the area in terms of abundance, reproduction, distribution, diversity, and habitat quality or function. Include the impacts of past and present federal actions as well. Don't forget to describe the impacts of past existence and operation of the action under consultation (for continuing actions).

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area. Future Federal actions that are unrelated (*i.e.,* not interrelated or interdependent) to the proposed action are not considered in this analysis because they will be subject to separate consultation pursuant to section 7 of the Act. (Note: Cumulative effects under ESA are ***not*** the same as the definition under NEPA. Be careful not to mix them up.) Describe the impacts of these cumulative effects in terms of abundance, reproduction, distribution, diversity, and habitat quality or function.

Present all known and relative effects to population, *e.g.,* fish stocking, fishing, hunting, other recreation, illegal collecting, private wells, development, grazing, local trust programs, etc. Include impacts to the listed and proposed species in the area that you know are occurring and that are unrelated to your action-- *e.g.,* road kills from off-road vehicle use, poaching, trespass, etc.

**EFFECTS OF THE ACTION**

The purpose of this section is to document your analysis of the potential impacts the proposed action will have on species and/or critical habitats. This analysis has two possible conclusions for listed species and designated critical habitat:

**(1) May Affect, Not Likely to Adversely Affect** – the appropriate conclusion when effects on a listed species are expected to be *discountable*, *insignificant*, or completely *beneficial*.

**Beneficial effects** – contemporaneous positive effects without any adverse effects

**Insignificant effects** – relate to the size of the impact and should never reach the scale where take would occur.

**Discountable effects** – those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

**(2) May Affect, Likely to Adversely Affect** – the appropriate finding if *any* adverse effect may occur to listed species or critical habitat as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial.

A finding of "may affect" is the primary trigger for initiating section 7 consultation. Further analysis leads to one of the two conclusions above. In the case of a determination that an action is "not likely to adversely affect" a species or critical habitat, you can request USFWS and/or NMFS concurrence with this determination and consultation can be concluded upon receipt of our concurrence. Determinations of "likely to adversely affect" require further consultation between the action agency and USFWS and NMFS. These consultations typically lead to the preparation of a biological opinion, although they can also lead to incorporation of additional protective measures that render the project "not likely to adversely affect" listed species or designated critical habitat. Any actions that are likely to result in the incidental take of a listed species are automatically considered "likely to adversely affect."

In the case of proposed species or proposed critical habitat, the possible conclusions are:

<u>Species</u>

**Likely to Jeopardize the Continued Existence**

**Not Likely to Jeopardize the Continued Existence**

<u>Critical Habitat</u>

**Likely to Destroy or Adversely Modify**

**Not Likely to Destroy or Adversely Modify**

The effects analysis includes assessment of:

Direct and indirect effects (stressors) of Federal action

Direct and indirect effects (stressors) of applicant's action

Direct and indirect effects (stressors) of interrelated or interdependent actions

Direct and indirect effects (stressors) of conservation and minimization measures

Remember: Direct and indirect effects under ESA are **not** the same as direct and indirect effects under NEPA. Be careful not to mix them up. Under ESA, direct effects are those that are caused by the action(s) and occur at the time of the action(s), and indirect effects are those that are caused by the action(s) and are later in time, but are still reasonably certain to occur.

Based on the various components of your action that you used to determine the extent of the action area, this analysis assesses the potential stressors resulting from each component and predicts the likely responses species and critical habitat will have. Note: don't forget to subsequently reconstruct the action to assess the combined stressors of the components. You may find that some stressors are synergistically minimized or avoided, whereas other stressors may increase.

Describe the stressors that are expected to result from each component. For example, instream actions may mobilize sediments that travel downstream as increased turbidity and then settle out as sediments on the stream substrate. Sound levels from machinery may be detectable hundreds of feet, thousands of feet, or even miles away. Describe these stressors in terms of their intensity, frequency, and duration.

Once you have determined the expected stressors resulting from an activity, the next step is to assess the overlap between those stressors and individuals of the species or components of critical habitat. The purpose of determining this overlap is to accurately and completely assess the potential exposure of species and habitat to the stressors resulting from the action. This exposure is the necessary precursor to any possible response those species and habitat may have. Your conclusions of "not likely to adverse affect" or "likely to adversely affect" are based in large part on this response.

To determine exposure, here is a basic set of questions you might answer:

- What are the specific stressors causing the exposure
- Where the exposure to the stressors would occur
- When the exposure to stressors would occur
- How long the exposure to stressors would occur
- What is the frequency of exposure to stressor
- What is the intensity of exposure to stressor
- How many individuals would be exposed
- Which populations those individuals represent
- What life stage would be exposed

For critical habitat, the questions would be similar but would focus on constituent elements of critical habitat.

Remember that exposure to a stressor is not always direct. For example, in some cases individuals of a species may be directly exposed to the sediment mobilized during construction. However, in other cases, individuals of the species would be exposed indirectly when sediment mobilized during construction settles out in downstream areas, rendering those areas unusable for later spawning or foraging.

Here are some examples of stressors you should address:

Exposure to abiotic factors affecting land, air, or water

Exposure to biotic factors affecting species behavior

Spatial or temporal changes in primary constituent elements of critical habitat

Loss or gain of habitat--direct and indirect

Fragmentation of habitat

Loss or gain of forage and/or foraging potential

Loss or gain of shelter/cover

Loss or gain of access through adjacent habitat/loss of corridors determine the potential response or range of responses the exposed individuals or components of critical habitat will have to those levels and types of exposure.

This is where the use of the best scientific and commercial information available becomes crucial. Your analysis must take this information into consideration and the resulting document must reflect the use of this information and your reasoning and inference based on that information. Bear in mind that this analysis may not be the final word on the expected responses as further consultation with USFWS or NMFS may refine this analysis.

Be sure to describe the expected responses clearly and focus your analysis towards determining if any of the possible responses will result in the death or injury of individuals, reduced reproductive success or capacity, or the temporary or permanent blockage or destruction of biologically significant habitats (*e.g.,* foraging, spawning, or lekking grounds; migratory corridors, etc.,). Any of these above responses are likely to qualify as adverse effects. If the available information indicates that no observable response is expected from the levels and types of exposure, the action may be unlikely to adversely affect a species or critical habitat. However, remember that no observable response may actually mask an invisible internal response such as increased stress hormone levels, elevated heart rate, etc. Depending on the fitness of the exposed individual and the surrounding environment (including other threats), these "invisible" responses may lead to more serious consequences. We recommend working with your NMFS or USFWS contact to determine the appropriate conclusion.

Don't forget to consider:

Individual responses based on the species biology and sensitivity to exposure

The combined effects of existing threats and new exposure

The combined effects of limiting factors and new exposure

Disrupted reproduction and/or loss of reproduction

Exposure and response of species and critical habitat to interrelated and interdependent actions

Understanding and avoiding the common flaws in developing an effect determination will save you considerable time. These common flaws are: the "Displacement" Approach (*i.e.*, the species will move out of the way; there are plenty of places for them to go); the "Not Known to Occur Here" Approach (*i.e.*, looking at survey results, or lack of results, instead of the Recovery Plan for the species); the "We'll Tell You Later" Approach (*i.e.*, if we find any, then we'll let you know and that is when we will consult); or the "Leap of Faith" Approach (*i.e.*, the agency wants the USFWS or NMFS to accept a determination based on trust, rather than the best scientific and commercially available information.). Sticking to flawed determinations will cost everyone time, money, and aggravation.

**Analysis of alternate actions**

This analysis is required for actions that involve preparation of an EIS. For all other actions, a summary of alternatives discussed in other environmental documents is useful.

## OTHER RELEVANT INFORMATION

Provide any other relevant available information the action, the affected listed species, or critical habitat. This could include local research, studies on the species that have preliminary results, and scientific and commercial information on aspects of the project.

## CONCLUSION

This is where you put your overall effect determination after you have analyzed the exposure and response of species and habitat to the stressors resulting from the proposed action and interrelated or interdependent actions. Effect determinations must be based on a sound reasoning from exposure to response and must be consistent with types of actions in the project description, the biology in the species accounts, the habitat status and condition, changes to the existing environment, and the best scientific and commercial information available.

Again, the two potential conclusions for **listed species** are:

Not likely to adversely affect species

Likely to adversely affect species

The two potential conclusions for **designated critical habitat** are:

Not likely to adversely affect critical habitat

Likely to adversely affect critical habitat

The two potential conclusions for **proposed species** are:

Not likely to jeopardize species

Likely to adversely jeopardize species

The potential conclusions for **proposed critical habitat** are, under informal and formal consultation respectively:

Not likely to adversely affect species

Likely to adversely affect species

Not likely to destroy or adversely modify critical habitat

Likely to destroy or adversely modify critical habitat

Include the basis for the conclusion, such as discussion of any specific measures or features of the project that support the conclusion and discussion of species expected response, status, biology, or baseline conditions that also support conclusion.

If you make a "no effect" determination, it doesn't need to be in the assessment, but you might have to defend it. Keep the documentation for your administrative record.

## LIST OF DOCUMENTS

Provide a list of the documents that have bearing on the project or the consultation, this includes relevant reports, including any environmental impact statements, environmental assessment, or biological assessment prepared for the project. Include all planning documents as well as the documents prepared in conformance with state environmental laws

**IMPORTANT NOTE**: Each of these documents must be provided with the initiation package consultation for the Services to be able to proceed with formal consultation.

**LITERATURE CITED**

We are all charged with using the best scientific and commercial information available. To demonstrate you did this, it is a good idea to keep copies of search requests in your record. If you used a personal communication as a reference, include the contact information (name, address, phone number, affiliation) in your record.

**LIST OF CONTACTS/CONTRIBUTORS/PREPARERS**

Please include contact information for contributors and preparers as well as local experts contacted for species or habitat information.

**GLOSSARY**

**Action Area** - all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

**Beneficial Effects** – contemporaneous positive effects without any adverse effects.

**Cumulative Effects –** are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur in the action area of the Federal action subject to consultation.

**Discountable Effects** – those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

**Effects of the Action** – refers to the direct and *indirect effects* of an action on the species or critical habitat, together with the effects of other activities that are *interrelated* or *interdependent* with that action, that will be added to the environmental baseline.

**Environmental Baseline** – includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process.

**Indirect Effects -** Indirect effects are those that are caused by the action(s) and are later in time, but are still reasonably certain to occur.

**Insignificant Effects** – relate to the size of the impact and should never reach the scale where take would occur.

**Interdependent Actions -** Interdependent actions are those that have no significant independent utility apart from the action that is under consideration, *i.e.* other actions would not occur "but for" this action.

**Interrelated Actions -** Interrelated actions are those that are part of a larger action and depend on the larger action for their justification, *i.e.* this action would not occur "but for" a larger action.

**Likely to Jeopardize the Continued Existence of** – to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

**May Affect, Likely to Adversely Affect** – the appropriate finding if any adverse effect may occur to listed species or critical habitat as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. Requires that a biological opinion be prepared by the Service.

**May Affect, Not Likely to Adversely Affect** – the appropriate conclusion when effects on a listed species are expected to be *discountable*, *insignificant*, or completely *beneficial*. Requires written concurrence from the Service.

**No Effect** – the appropriate conclusion when a listed species will not be affected, either because the species will not be present <u>or</u> because the project does not have <u>any</u> elements with the potential to affect the species. A "no effect" determination does **not** require written concurrence from the Service and ends

ESA consultation requirements.  Action agency should document their reasoning for this conclusion in their file.

Endangered and Threatened Species and Critical Habitats
under the Jurisdiction of the NOAA Fisheries Service

## Florida-Atlantic

| Listed Species | Scientific Name | Status | Date Listed |
|---|---|---|---|
| **Marine Mammals** | | | |
| blue whale | *Balaenoptera musculus* | Endangered | 12/02/70 |
| finback whale | *Balaenoptera physalus* | Endangered | 12/02/70 |
| humpback whale | *Megaptera novaeangliae* | Endangered | 12/02/70 |
| North Atlantic right whale | *Eubalaena glacialis* | Endangered | 12/02/70 |
| sei whale | *Balaenoptera borealis* | Endangered | 12/02/70 |
| sperm whale | *Physeter macrocephalus* | Endangered | 12/02/70 |
| **Turtles** | | | |
| green sea turtle | *Chelonia mydas* | Threatened[1] | 07/28/78 |
| hawksbill sea turtle | *Eretmochelys imbricata* | Endangered | 06/02/70 |
| Kemp's ridley sea turtle | *Lepidochelys kempii* | Endangered | 12/02/70 |
| leatherback sea turtle | *Dermochelys coriacea* | Endangered | 06/02/70 |
| loggerhead sea turtle | *Caretta caretta* | Threatened | 07/28/78 |
| **Fish** | | | |
| shortnose sturgeon | *Acipenser brevirostrum* | Endangered | 03/11/67 |
| smalltooth sawfish | *Pristis pectinata* | Endangered | 04/01/03 |
| **Invertebrates** | | | |
| elkhorn coral | *Acropora palmata* | Threatened | 5/9/06 |
| staghorn coral | *Acropora cervicornis* | Threatened | 5/9/06 |
| **Seagrasses** | | | |
| Johnson's seagrass | *Halophila johnsonii* | Threatened | 09/14/98 |

**Designated Critical Habitat**
Right whale: Between 31°15'N (approximately the mouth of the Altamaha River, Georgia) and 30°15'N (approximately Jacksonville, Florida) from the coast out to 15 nautical miles offshore; the coastal waters between 30°15'N and 28°00'N (approximately Sebastian Inlet, Florida) from the coast out to 5 nautical miles.

[1] Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered

## Designated Critical Habitat (continued)

Johnson's seagrass: A final rule designating Johnson's seagrass critical habitat was published on April 5, 2000 (65 FR 17786) and 10 geographic areas (units) within the range of the species were identified along the east coast of Florida.

Elkhorn and Staghorn Corals: All waters in the depths of 98 ft (30 m) and shallower to the 6 ft (1.8 m) contour from Boynton Inlet, Palm Beach County, to Government Cut, Miami-Dade County; and the mean low water line from Government Cut south to 82° W longitude in Monroe Counties. Within these specific areas, the essential feature consists of natural consolidated hard substrate or dead coral skeleton that are free from fleshy or turf macroalgae cover and sediment cover. Maps and details regarding coral critical habitat can be found at: http://sero.nmfs.noaa.gov/pr/esa/acropora.htm

## Proposed Critical Habitat

Smalltooth Sawfish: A proposed rule to designate smalltooth sawfish critical habitat was published on November 20, 2008 (73 FR 70290). Proposed critical habitat consists of two coastal habitat units: the Charlotte Harbor Estuary Unit and the Ten Thousand Islands/Everglades Unit. Maps and details regarding the proposed critical habitat rule can be found at: http://sero.nmfs.noaa.gov/pr/SmalltoothSawfish.htm

## Species Proposed for Listing

None

| Candidate Species[2] | Scientific Name |
|---|---|
| None | |

| Species of Concern[3] | Scientific Name |
|---|---|
| **Fish** | |
| Atlantic sturgeon | *Acipenser oxyrhynchus oxyrhynchus* |
| dusky shark | *Carcharhinus obscurus* |
| key silverside | *Menidia conchorum* |
| largetooth sawfish | *Pristis pristis* |
| mangrove rivulus | *Rivulus marmoratus* |
| Nassau grouper | *Epinephelus striatus* |

[2] The Candidate Species List has been renamed the Species of Concern List. The term "candidate species" is limited to species that are the subject of a petition to list and for which NOAA Fisheries Service has determined that listing may be warranted (69 FR 19975).

[3] Species of Concern are not protected under the Endangered Species Act, but concerns about their status indicate that they may warrant listing in the future. Federal agencies and the public are encouraged to consider these species during project planning so that future listings may be avoided.

| | |
|---|---|
| night shark | *Carcharinus signatus* |
| opossum pipefish | *Microphis brachyurus lineatus* |
| saltmarsh topminnow | *Fundulus jenkinsi* |
| sand tiger shark | *Carcharias taurus* |
| speckled hind | *Epinephelus drummondhayi* |
| striped croaker | *Bairdiella sanctaeluciae* |
| Warsaw grouper | *Epinephelus nigritus* |
| **Invertebrates** | |
| ivory bush coral | *Oculina varicosa* |

[1] The Candidate Species List has been renamed the Species of Concern List. The term "candidate species" is limited to species that are the subject of a petition to list and for which NOAA Fisheries Service has determined that listing may be warranted (69 FR 19975).

[1] Species of Concern are not protected under the Endangered Species Act, but concerns about their status indicate that they may warrant listing in the future. Federal agencies and the public are encouraged to consider these species during project planning so that future listings may be avoided.

March 22, 2011

Dear Ms. Karazsia,

We are sending this letter in response to your March 14, 2011 email request for comments on the proposed ODMDS expansion near Port Everglades, FL, as provided in the USACE Port Everglades ODMDS expansion scoping letter of March 11, 2011. A review of our data suggests several areas of potential hard bottom resources may be affected by the expansion.

We have been mapping benthic habitats in SE FL for many years and have an extensive database on benthic resources in the area. The former Calypso pipeline and deep-water port projects included mapping a large area of the seafloor in close proximity to the ODMDS by interpreting multibeam and sidescan bathymetry into benthic habitat maps. These were video groundtruthed from ROV transects over comparatively small areas of the project's extent. Although technological limits inhibited large-scale mapping of small, low relief areas or individual rocks and boulders throughout the study area, they were included as an additional layer along the groundtruthed ROV routes to show small-scale occurrences. This is important with regard to the expansion of the ODMDS because large areas were mapped as sediment polygons, yet there were several occurrences of small hardbottom patches mapped as point and line data. These point and line data might be missed if only the polygons were referenced.

The current proposed ODMDS expansion area, outlined in green, appears to include several areas of potential hardbottom habitats or remnants of previous dumping (Figure 1). A 2001 Naval Oceanographic Office (NAVO) bathymetric survey shows several elongated areas of variable relief trending WNW-ESE. We have outlined three of these with yellow ovals in Figure 1, below. The southernmost oval lies mostly within the outlined proposed expanded ODMDS (outlined in green) but extends at least 0.5 km to the west outside the boundary. The middle yellow oval lies completely within the existing ODMDS (outlined in red). The northernmost oval lies north of the present ODMDS but inside the proposed expansion area. One of our prior ROV Transects for the Calypso Pipeline (thick tan line in Figure 1) confirmed the presence of hardbottom at the eastern end of the northernmost yellow oval.

An excerpt from our original notes on this section of survey between Mileposts 30 and 29, over a depth range of 717-721 ft (218-220 m) and covering a 6-min period from 26 07.950'N, 080 01.252'W to 26 07.953'N, 080 01.205'W is as follows:

> "Something in outboard camera rock boulder 2 ft across, might be a little boulder field, some relief in sonar, only one in video.
> Another boulder in outboard camera, appeared 3ft in diameter, surrounding bottom mud with sparser bioturbation.
> Two-ft across boulder, anemones, hydroid, striation almost coral-like like a head type of coral? Bathynectes.
> Boulders within 30m scale on sonar, not dense but a few scattered.
> Rock boulder with sponge hexactinellid?ct tube sponge?? 10 cm tall. Surrounding bottom flat sand with slight bioturbation, Thalassia detritus, Coronaster, anemone.
> Close to track slightly south 50 ft.
> 1-2 ft boulder 1ft relief, anemones, hydroid, fishing line."

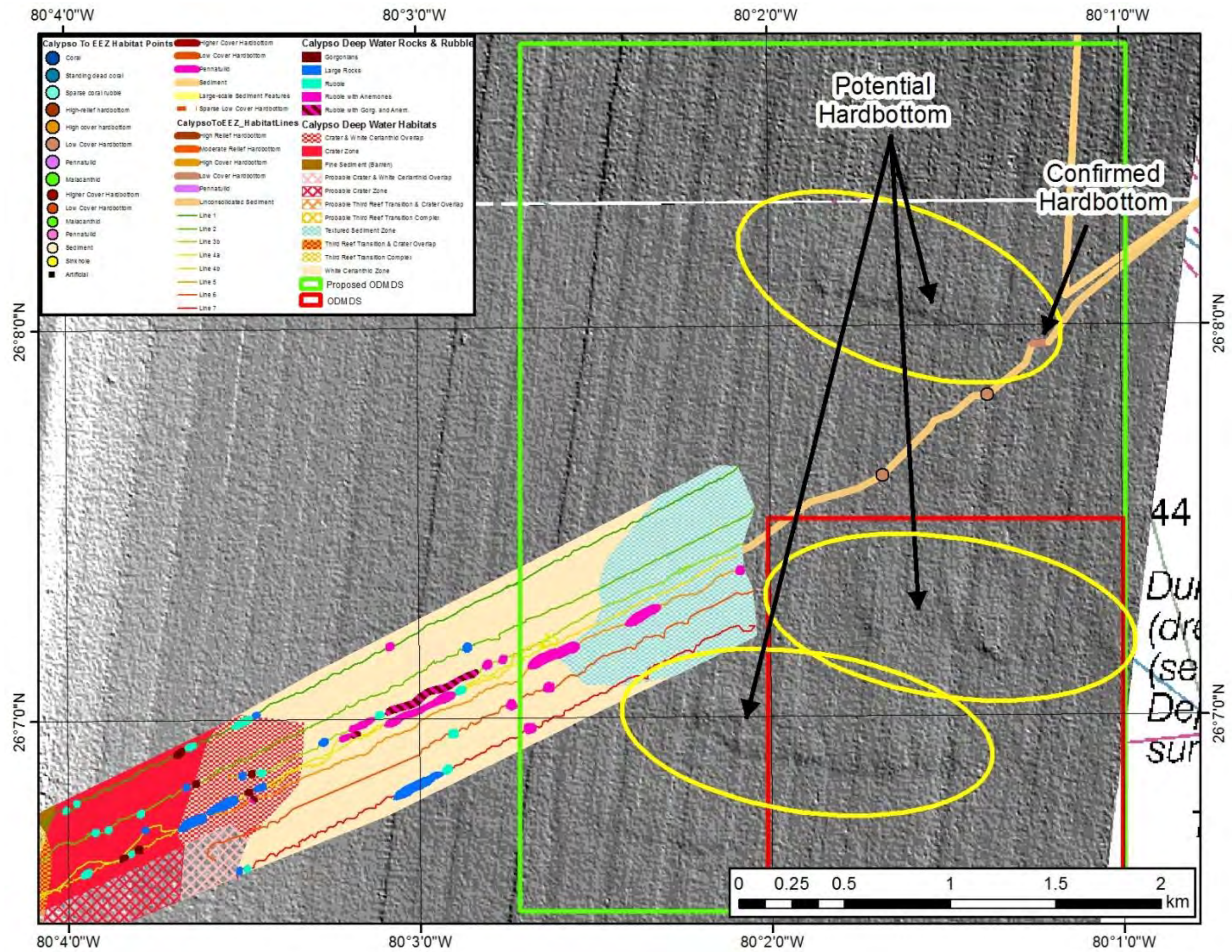


Figure 1. Variable relief in bathymetry and incidences of hardbottom occurrences along ROV transects indicate three large areas on potential hardbottom near and within the present ODMDS.

This information leads us to believe that there is a high probability that the three larger areas of variable relief extending west-northwest in the proposed ODMDS may be hardbottom habitat.

In addition to the northern area of the upper oval, shallower Calypso benthic video surveys in 90-200 m also exhibited numerous areas of rubble (thick pink sections along survey lines in Fig 1) within the proposed expanded ODMDS. Examples from those field notes (with depths converted from feet to meters) follow:

<u>LINE 5:</u>
184 m: soft bottom with <u>bits of scattered rubble</u>; anemones; white tubes; dead *Thalassia*; sole; asteroid; scorpaenid
<u>LINE 6:</u>
181 m; soft mud bottom; anemones; sole; <u>small bits of rubble</u>; numerous anemones; <u>scattered rubble</u> <u>rock</u>; orange scorpaenid; back into smooth soft sediment
<u>LINE 7:</u>
183 m: Anemones; sole; curved tubes out of bottom; *Coronaster*; ophiuroid; <u>rubble field; small scattered rubble</u>; bottles crabs; dead *Thalassia*

This information indicates that small-scale hardbottom features exist within the western portion of the proposed ODMDS expansion area.

In summary, available data indicate the presence of hardbottom habitats inside the proposed ODMDS expansion area. Seafloor bathymetric imaging shows large areas of variable, low relief surface inside the present ODMDS and the proposed area that typically indicate hardbottom habitat. Present data do not confirm the nature (artificial v. natural), extent or biological composition of most of these features. More detailed investigation of their extent and biological communities would be useful before a determination is made on the proposed ODMDS expansion.

Sincerely,

Brian Walker, Charles Messing, and Richard Dodge
Nova Southeastern University

US Army Corps of Engineers.
Jacksonville District

# Comments/ Questions

See Privacy Act Statement on reverse side

SUBJECT/EVENT: Port Everglades ODMDS Expansion Environmental Assessment Scoping Meeting W912EP-11-F-0024

DATE: March 31, 2011 6-8pm

COMMENTS/QUESTIONS

- Will USACE Regulatory projects be able to use the site for Disposal of material?

- Where did the calculation of 6.65 mcy come from? - Is that the total site capacity?

- Will there be a designated area for Rock dumping

- Were future regulatory projects calculated into the total capacity amount? known future Regulatory projects should be discussed in the EA

US Army Corps of Engineers
Melody White, Project Manager
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**REPRESENTING (Check one)**

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___ AGRICULTURE
___ GROUP
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___ OTHER

Do you wish to have your name included on the mailing list for future information?

_X_ YES ___ NO

Comments may also be mailed to:

US Army Corps of Engineers, Jacksonville District
PO Box 4970, Jacksonville, FL 32232-0019
ATTN: Joelle L. Verhagen (CESAJ-PD-EC)

US Environmental Protection Agency, Region 4
61 Forsyth Street, Atlanta, GA 30303
ATTN: Christopher McArthur (Coordinator, Wetlands, Coastal & Oceans Branch)

*THIS INFORMATION IS RELEASABLE UNDER THE FREEDOM OF INFORMATION ACT.*

*CESAD FORM 935, OCT 98*

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**PRIVACY ACT STATEMENT**

AUTHORITY: 42 USC 4321, 4331-4335

PRINCIPAL PURPOSES: Information on this card is used for organization and conduct of this meeting. It may be added to the mailing list for notification of future meetings on the topic and for addressing correspondence subsequent to the meeting.

ROUTINE USES: This information is a public record and may be disclosed to other Federal or local agencies for governmental purposes as well as to private individuals and organizations under the Freedom of Information Act.

MANDATORY OR VOLUNTARY DISCLOSURE: Completion of this card is voluntary. However, failure to supply the information requested may result in your (or your agency's) omission from further notification regarding participation in the process.

*CESAD FORM 935, OCT 98*

Florida Department of
Environmental Protection
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000



April 29, 2011

Ms. April N. Patterson
Jacksonville District, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

RE: U.S. Environmental Protection Agency and U.S. Army Corps of Engineers – Scoping Notice – Proposed Expansion of the Port Everglades Ocean Dredged Material Disposal Site (ODMDS) – Offshore Broward County, Florida.
SAI # FL201103185693C

Dear Ms. Patterson:

The Florida State Clearinghouse has coordinated a review of the public notice under the following authorities: Presidential Executive Order 12372; Section 403.061(42), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The Florida Department of Environmental Protection's (DEP) Offshore Projects-Outer Continental Shelf Program has advised that the Draft EA should include analyses of surveys providing a thorough description of the proposed expansion areas including, but not limited to: benthic habitats, deepwater corals, hard bottom/live bottom and possible cultural resources. These surveys should include visual verifications of benthic habitat types (e.g., video). Previous surveys conducted within the northern proposed expansion area have noted possible hard bottom habitat and possible cultural resources. The expansion of the Port Everglades ODMDS would move the western boundary closer to known nearshore coral reef systems. An analysis should be conducted to determine whether the reef system in the vicinity will encounter any additional impacts from sedimentation occurring during use of the expanded ODMDS.

Subsequent to the designation of the Port Everglades ODMDS in 2005, Calypso LNG was issued permits to build a liquefied natural gas pipeline from Port Everglades to the Bahamas. Since the proposed route of the future pipeline runs through the middle of the ODMDS expansion area, the Calypso LNG project should be addressed in the Draft EA. DEP staff looks forward to working with the U.S. Environmental Protection Agency and U.S. Army Corps of Engineers on the proposed expansion of the Port Everglades ODMDS.

For further information and assistance, please contact Ms. Debby Tucker or Ms. Shana Kinsey at (850) 245-2163 or Debby.Tucker@dep.state.fl.us, Shana.Kinsey@dep.state.fl.us.

Based on the information contained in the public notice and comments provided by our reviewing agencies, at this stage, the state has no objections to the proposed federal action. To ensure the project's consistency with the Florida Coastal Management Program, the concerns identified by the state during the on-going interagency coordination meetings and subsequent reviews must be addressed prior to project implementation.

Thank you for the opportunity to review the proposed project. Should you have any questions regarding this letter, please contact Mr. Chris Stahl at (850) 245-2169.

Yours sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/cjs

cc: Debby Tucker, OIP-OCS Program

| | |
|---|---|
| **From:** | Jordan-Sellers, Terri SAJ |
| **To:** | McArthur, Chris |
| **Cc:** | Verhagen, Joelle SAJ |
| **Subject:** | FW: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267 (UNCLASSIFIED) |
| **Date:** | Tuesday, April 30, 2013 2:37:00 PM |
| **Attachments:** | US Navy letter - 1995 stay out of the box.pdf |

Classification: UNCLASSIFIED
Caveats: NONE

Chris - you asked for the "stay out of our box" documentation from the Navy - see the email chain below - as well as the attached letter from 1995.

-----Original Message-----
From: Patterson, April SAJ
Sent: Tuesday, October 12, 2010 5:08 PM
To: Bearce, John W SAJ
Cc: Murphy, Jerry T SAJ; Jordan-Sellers, Terri SAJ
Subject: FW: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267

John,

Terri and I have been trying to communicate with the Navy about this issue and how it impacts our Port Everglades ODMDS expansion. At this point, I think it is definitely an operational issue and would appreciate your help getting to the bottom of it.

Thanks,
April

April Patterson
U.S. Army Corps of Engineers
Jacksonville District
(904) 232-2610 office
(904) 502-5325 mobile
April.N.Patterson@usace.army.mil

-----Original Message-----
From: Garbini, Douglas J CIV NSWCCD Ft. Lauderdale, 7540
[mailto:douglas.garbini@navy.mil]
Sent: Tuesday, October 12, 2010 4:22 PM
To: Allen, Nancy P CIV NAVFAC SE; Patterson, April SAJ
Subject: RE: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267

Nancy,
Thanks for the response. I'm a bit indisposed at the moment as we are currently conducting a test on the range. I will be back in my office tomorrow.

Doug

-----Original Message-----
From: Allen, Nancy P CIV NAVFAC SE

Sent: Tuesday, October 12, 2010 15:24
To: 'Patterson, April SAJ'
Cc: Garbini, Douglas J CIV NSWCCD Ft. Lauderdale, 7540; Allen, Nancy P CIV NAVFAC SE
Subject: FW: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267
Importance: High

April,

There does appear to be an operational issue with the proposed ODMDS. Please see the email below. If you haven't called Douglas yet, please do to discuss. Regards, Nancy

Nancy Allen
Marine Species Specialist
Environmental Planning EV 21
NAVFAC SE
Box 30, Building 903
NAS Jacksonville, FL 32212
904-542-6302

-----Original Message-----
From: Garbini, Douglas J CIV NSWCCD Ft. Lauderdale, 7540
Sent: Tuesday, October 12, 2010 15:06
To: Timoney, Gregory P CIV NAVFAC SE, EV-21
Cc: Allen, Nancy P CIV NAVFAC SE; Casey, James J CTR USFF, N7; Dahl, David A CIV CNRSE HQ, N3; Kalin, Robert E, USFF Range Analyst N454SE/CNRSE N40.31; Conway, John D CIV NAVFAC SE, JAXS; Venezia, William A CIV NSWCCD Ft Lauderdale, 7540; Minopoli, Ciro CIV NSWCCD W. Bethesda, 7500; Phillips, Michael P CIV NSWCCD W. Bethesda, 3530; Conway, John D CIV NAVFAC SE, JAXS
Subject: RE: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267

Sir,
Yes indeed, my facility and the US Navy is still utilizing this area extensively and will continue to do so into the foreseeable future. In review of your drawings, I note the disposal area is in close proximity to our restricted area. Please be advised that some of our cables and instrumentation extend behind the restricted area and the disposal area as marked, may adversely impact our operations.

Additionally, the site has started looking into expanding the restricted area to the east and south to protect more of our operations. We have had initial conversations with an ACOE representative to that end.

At your earliest convenience, I would like an opportunity to discuss the USACOE's spill disposal action, when it might occur, impacts to our site and operations; our site's current operations and the geographic locations of our cables and underwater equipment and the Navy's future needs of these water's.

Respectfully,
Douglas Garbini
Site Director,
South Florida Ocean Measurement Facility (formerly SFTF)
(954) 926-4005

-----Original Message-----
From: Timoney, Gregory P CIV NAVFAC SE, EV-21
Sent: Tuesday, October 12, 2010 9:06
To: Garbini, Douglas J CIV NSWCCD Ft. Lauderdale, 7540
Cc: Allen, Nancy P CIV NAVFAC SE; Casey, James J CTR USFF, N7; Dahl, David A CIV CNRSE HQ, N3; Kalin, Robert E, USFF Range Analyst N454SE/CNRSE N40.31; Conway, John D CIV NAVFAC SE, JAXS
Subject: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267

Mr. Garbini,

Ms. Patterson at USACOE needs to validate your agency is still utilizing the at sea area which may be impacted by the spills disposal area (see below). Can you check and respond to her, info James Casey and Patsy Kerr, who deal with at sea encroachment at USFF, and John, Nancy Allen, and I here at NAVFACSE?

R,
Greg Timoney

Greg Timoney
NAVFACSE NEPA Planning and Compliance
Bldg 903 NAS Jacksonville
Jacksonville, FL 32212
904-542-6866 dsn 942

-----Original Message-----
From: Greg Timoney [mailto:gptimoney@gmail.com]
Sent: Thursday, October 07, 2010 20:27
To: Dahl, David A CIV CNRSE HQ, N3; Casey, James J CTR USFF, N7; patrica.kerr@navy.mil
Cc: Allen, Nancy P CIV NAVFAC SE; Kalin, Robert E, USFF Range Analyst N454SE/CNRSE N40.31; Timoney, Gregory P CIV NAVFAC SE, EV-21; Barfield, Richard A CIV NAVFAC SE, Counsel; Larrea, Meg A CDR RLSO SE, JACKSONVILLE; Roper, Jennifer L CDR CNRSE HQ, N40L
Subject: Fwd: FW: FIGURE: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267

Gentlemen, Patsy,

Nancy's dealing with a RFI from ACOE regarding the South Florida Test Facility. It's an at-sea issue but relatively nearshore so I'm not sure which agency should close the loop with the command and ACOE. The issue is a potential, or existing conflict between SFTF and an ODMDS, NAVSEA had some years ago ('95 indicated by letter, enclosed) they had an interest in the area.

R,
GT

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From: Allen, Nancy P CIV NAVFAC SE
Sent: Thu 10/7/2010 3:31 PM
To: Timoney, Gregory P CIV NAVFAC SE, EV-21
Subject: FW: FIGURE: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267

Nancy Allen
Marine Species Specialist
Environmental Planning EV 21
NAVFAC SE
Box 30, Building 903
NAS Jacksonville, FL 32212
904-542-6302
-----Original Message-----
From: Patterson, April SAJ [mailto:April.N.Patterson@usace.army.mil]
Sent: Thursday, October 07, 2010 15:27
To: Allen, Nancy P CIV NAVFAC SE
Subject: FW: FIGURE: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267 Nancy, Here is the origination of the larger box in the drawing that includes the Anchoring Area.
Please let me know what you can about the locations as soon as possible.
Thanks,
April
-----Original Message-----
From: Mcarthur.Christopher@epamail.epa.gov
[mailto:Mcarthur.Christopher@epamail.epa.gov]
Sent: Wednesday, July 21, 2010 9:36 AM
To: Jason Seitz
Cc: Patterson, April SAJ; Schuster, Glenn R SAJ; 'Lori Brownell'; 'Nadia Lombardero'; 'Perry F. Vaught'; 'Robert DiRienzo'; Jordan-Sellers, Terri SAJ
Subject: Re: FIGURE: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267
Jason:
Attached is the letter we received from the Navy on their SFTF boundaries (see pg. 3). Can you check for consistency with what the USACE provided you?
Thanks,
Chris
(See attached file: Appendix_A.pdf)
---------------------------------------------------------------------------
-
--
Christopher J. McArthur, P.E.
Environmental Engineer, Ocean Dumping Program Coordinator U.S. Environmental Protection Agency Region 4 Wetlands & Marine Regulatory Section
61 Forsyth Street, SW
Atlanta, GA 30303
Phone: (404) 562-9391; Fax: (404) 562-9343
email: mcarthur.christopher@epa.gov
http://www.epa.gov/region4/water/oceans/
---------------------------------------------------------------------------
-
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From: "Jason Seitz" <Jseitz@anamarinc.com>

To: "'Patterson, April SAJ'" <April.N.Patterson@usace.army.mil>, Christopher McArthur/R4/USEPA/US@EPA,
"'Jordan-Sellers, Terri SAJ'"
<Terri.Jordan-Sellers@usace.army.mil>, "'Schuster, Glenn R SAJ'"
<Glenn.R.Schuster@usace.army.mil>

Cc: "'Nadia Lombardero'" <Nlombardero@anamarinc.com>, "'Lori Brownell'" <lbrownell@taylorengineering.com>,
"'Robert DiRienzo'" <rdirienzo@taylorengineering.com>, "'Perry

F. Vaught'"
<pvaught@taylorengineering.com>

Date: 07/20/2010 02:18 PM

Subject: FIGURE: Port Everglades 1-cm Contour Line, US Navy Zone, and ODMDS AEC:0013267

Attached is a figure by Taylor Engineering that illustrates the current ODMDS boundaries, the 1-cm contour, recommended expansion boundaries, and the US Navy restricted area. This figure will be handy to have during tomorrow morning's teleconference.
Note the distance between the southern boundary of the proposed expansion area and the northern boundary of the Navy restricted area.
Robert DiRienzo tells me the shortest distance between the restricted area and the 1-cm contour line is greater than 6,600 feet. Looks like we have some breathing room in case we need to expand southward.
Jason
Jason C. Seitz
Biologist
ANAMAR Environmental Consulting, Inc.
2106 NW 67th Place, Suite 5
Gainesville, Florida 32653
Office 352.377.5770 ext. 116
<http://www.anamarinc.com/> www.anamarinc.com GSA Contract # GS-10F-0056T SDB and Woman-Owned Small Business [attachment "winmail.dat" deleted by Christopher McArthur/R4/USEPA/US] [attachment "message_body.rtf" deleted by Christopher McArthur/R4/USEPA/US] [attachment "C2009-081-RESTRICTED AREA.pdf"
deleted by Christopher McArthur/R4/USEPA/US]

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Earth abides - faith manages.

Classification: UNCLASSIFIED
Caveats: NONE

DEPARTMENT OF THE NAVY
NAVAL SURFACE WARFARE CENTER
CARDEROCK DIVISION

SOUTH FLORIDA TESTING FACILITY
8010 NORTH OCEAN DRIVE
DANIA, FL 33004

IN REPLY REFER TO:

5000
Ser 7110/159
30 Jun 95

From: Officer in Charge, Naval Surface Warfare Center, Carderock Division Detachment, South Florida Testing Facility
To: Planning Division, Environmental Coordination Section, Department of the Army, Jacksonville District Corps of Engineers, P.O. Box 4970, Jacksonville, FL 32232-0019

Subj: OFF-SHORE DREDGED MATERIAL DISPOSAL SITE

Ref: (a) Chief, Planning Division, Jacksonville District Corps of Engineers ltr of 17 Apr 95

1. This is in response to reference (a) regarding your request to the U.S. Environmental Protection Agency (EPA) to designate an Offshore Dredged Material Disposal Site offshore Port Everglades, Florida, for the disposal of dredged material from the Port Everglades area. As the referenced letter states, the entrance channel and turning basin of Port Everglades must receive periodic maintenance dredging to ensure safe navigation.

2. The Naval Surface Warfare Center, Carderock Division Detachment, South Florida Testing Facility strongly supports your request to the EPA and the designation of an Offshore Dredged Material Disposal Site offshore Port Everglades. Due to the nature of the South Florida Testing Facility's operations, however, some careful attention to the location of the site is requested.

3. The South Florida Testing Facility (SFTF) conducts surface and subsurface trials of Navy vessels, and has an extensive underwater cable range off the coast south of Port Everglades. It is requested that all considerations involving the actual disposal site include the exclusion of the SFTF test range bounded by the following coordinates:

| | |
|---|---|
| North-west corner: | 80° 06' 30" West, 26° 06' 30" North |
| North-east corner: | 79° 40' 00" West, 26° 06' 30" North |
| South-east corner: | 79° 40' 00" West, 26° 00' 00" North |
| South-west corner: | 80° 07' 00" West, 26° 00' 00" North |

Exclusion of this area shall insure that any disposal activities will not interfere with range operations. Additional information regarding our test range is contained in Title 33 Code of Federal Regulations, Navigation and Navigable Waters, designated as restricted area 334.580.

Subj: OFF-SHORE DREDGED MATERIAL DISPOSAL SITE

4. If you have any questions, please contact William Baxley, Environmental Site Manager, at (305) 926-4015.

M C Ruddeforth

M.C. RUDDEFORTH

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

Mr. Fred Dayhoff, Tribal Representative
NAGPRA, Section 106
Miccosukee Tribe of Indians of Florida
Post Office Box 440021
Tamiami Station
Miami, Florida 33144

Dear Mr. Dayhoff:

The U.S. Army Corps of Engineers (Corps), Jacksonville District and the EPA are selecting a location for an expanded Port Everglades Ocean Dredged Material Disposal Site (ODMDS) in the Atlantic Ocean offshore of Ft. Lauderdale, Florida. On January August 25, 2011, the Division of Historic Resources concurred with the Corps' determination that this project had the potential to adversely affect unrecorded submerged historic properties within the proposed alternative project areas and a submerged remote sensing cultural resources survey was needed (DHR Project File No. 2011-03638).

Panamerican Consultants, Inc (PCI) was contracted to conduct the submerged cultural remote sensing survey. In their report, "*Cultural Resources Remote Sensing Survey of the Port Everglades Channel and Ocean Dredged Material Disposal Site (ODMDS) Broward County, Florida,*" they identified two side scan sonar targets (C23 and C70) potentially indicative of historic resources within the Port Everglades ODMDS (Figure 1).

On July 12, 2012, Corps Staff Archeologist, Wendy Weaver, assisted the Corps' Hydrographic Survey aboard the R/V *Florida* in a higher resolution side scan sonar survey of the two targets. During the survey, Ms. Weaver monitored the raw data received from an Edgetech 4200 dual frequency (600 kHz) sidescan sonar. Ms. Weaver was able to confirm that the two targets comprised non-cultural debris (C70) and a modern pleasure craft (C23) and that the proposed ODMDS does not contain any significant cultural resources.

Based on Corps Staff Archeologist reconnaissance, the Corps has determined that the Port Everglades ODMDS Alternatives 1 and 2 will have no effect on historic properties. I request your comments on this determination. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

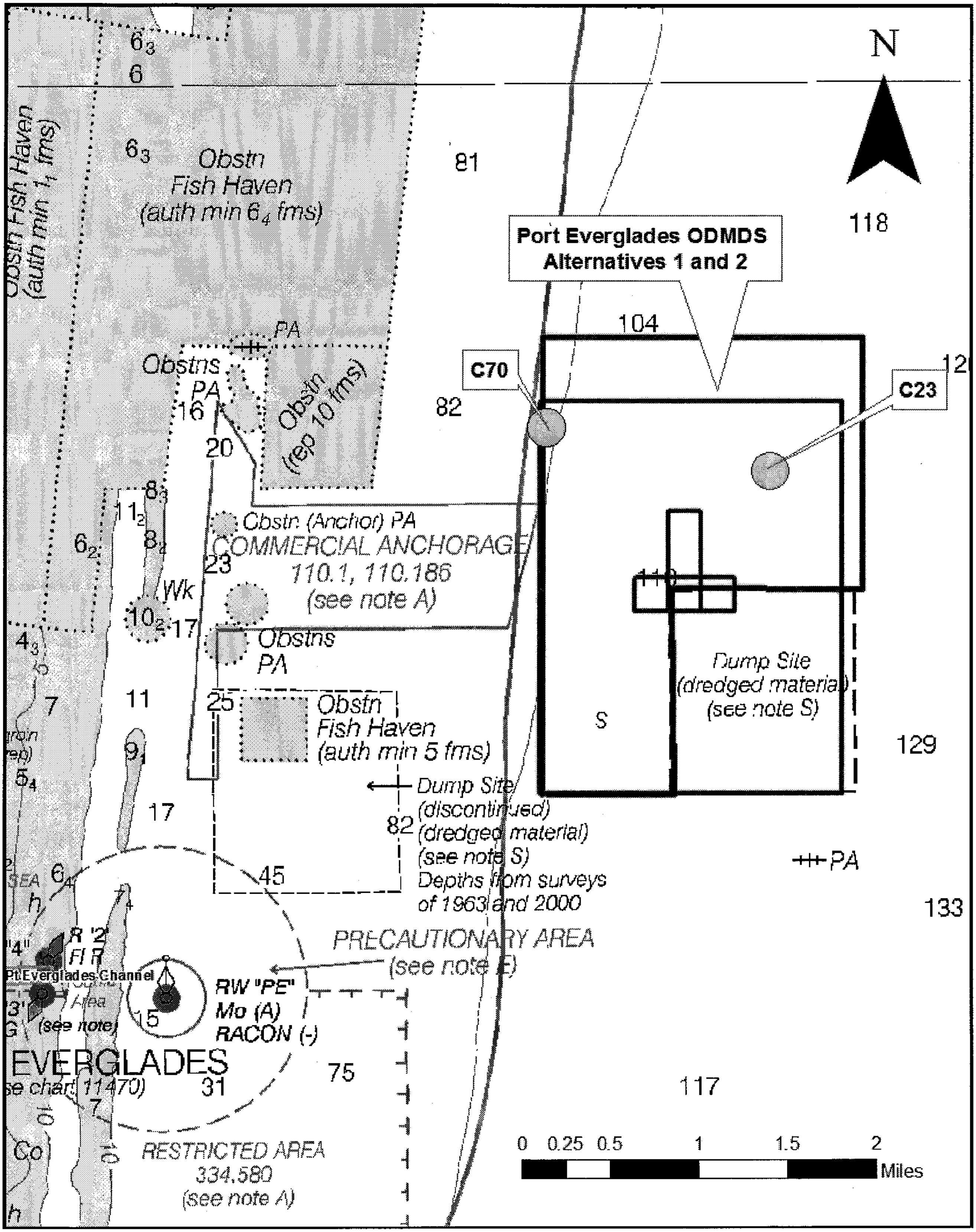


**Figure 1. Location of the Port Everglades ODMDS Alternatives 1 and 2 and Targets C23 and C70.**

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

Mr. Paul Backhouse
Seminole Tribe of Florida
Tribal Historic Preservation Office
30290 Josie Billie Highway
PMP 1004
Clewiston, FL 33440

Dear Mr. Backhouse:

The U.S. Army Corps of Engineers (Corps), Jacksonville District and the EPA are selecting a location for an expanded Port Everglades Ocean Dredged Material Disposal Site (ODMDS) in the Atlantic Ocean offshore of Ft. Lauderdale, Florida. On January August 25, 2011, the Division of Historic Resources concurred with the Corps' determination that this project had the potential to adversely affect unrecorded submerged historic properties within the proposed alternative project areas and a submerged remote sensing cultural resources survey was needed (DHR Project File No. 2011-03638).

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On July 12, 2012, Corps Staff Archeologist, Wendy Weaver, assisted the Corps' Hydrographic Survey aboard the R/V *Florida* in a higher resolution side scan sonar survey of the two targets. During the survey, Ms. Weaver monitored the raw data received from an Edgetech 4200 dual frequency (600 kHz) sidescan sonar. Ms. Weaver was able to confirm that the two targets comprised non-cultural debris (C70) and a modern pleasure craft (C23) and that the proposed ODMDS does not contain any significant cultural resources.

Based on Corps Staff Archeologist reconnaissance, the Corps has determined that the Port Everglades ODMDS Alternatives 1 and 2 will have no effect on historic properties. I request your comments on this determination. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

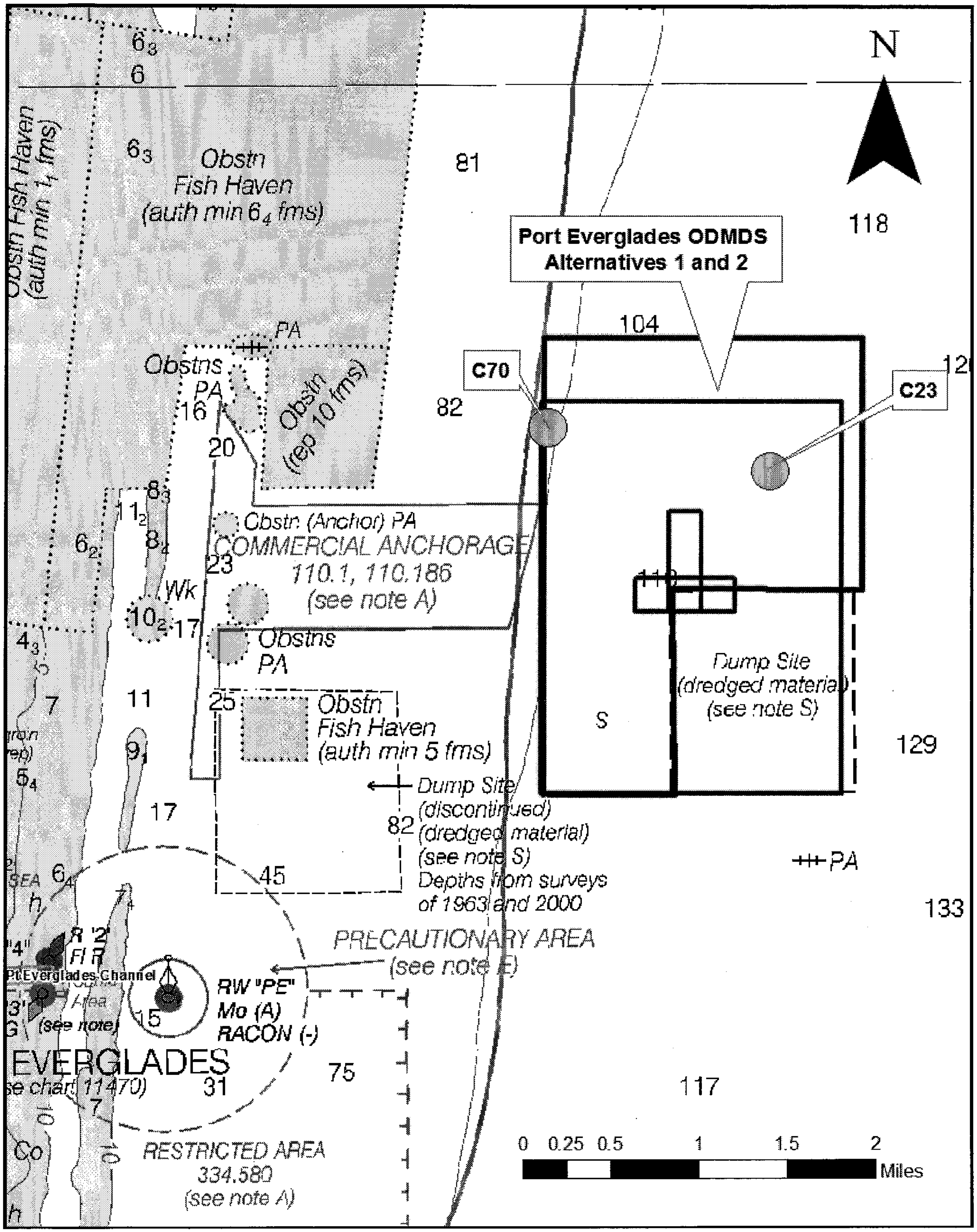


**Figure 1. Location of the Port Everglades ODMDS Alternatives 1 and 2 and Targets C23 and C70.**

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch



Mr. Robert Bendus
Division of Historical Resources
State Historic Preservation Officer
500 South Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Bendus:

The U.S. Army Corps of Engineers (Corps), Jacksonville District and the EPA are selecting a location for an expanded Port Everglades Ocean Dredged Material Disposal Site (ODMDS) in the Atlantic Ocean offshore of Ft. Lauderdale, Florida. On January August 25, 2011, the Division of Historic Resources concurred with the Corps' determination that this project had the potential to adversely affect unrecorded submerged historic properties within the proposed alternative project areas and a submerged remote sensing cultural resources survey was needed (DHR Project File No. 2011-03638).

Panamerican Consultants, Inc (PCI) was contracted to conduct the submerged cultural remote sensing survey. In their report, "*Cultural Resources Remote Sensing Survey of the Port Everglades Channel and Ocean Dredged Material Disposal Site (ODMDS) Broward County, Florida,*" they identified two side scan sonar targets (C23 and C70) potentially indicative of historic resources within the Port Everglades ODMDS (Figure 1).

On July 12, 2012, Corps Staff Archeologist, Wendy Weaver, assisted the Corps' Hydrographic Survey aboard the R/V *Florida* in a higher resolution side scan sonar survey of the two targets. During the survey, Ms. Weaver monitored the raw data received from an Edgetech 4200 dual frequency (600 kHz) sidescan sonar. Ms. Weaver was able to confirm that the two targets comprised non-cultural debris (C70) and a modern pleasure craft (C23) and that the proposed ODMDS does not contain any significant cultural resources.

Based on Corps Staff Archeologist reconnaissance, the Corps has determined that the Port Everglades ODMDS Alternatives 1 and 2 will have no effect on historic properties. I request your concurrence on this determination. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

Weaver/CESAJ-PD-EP ww
Hughes/CESAJ-PD-EP
Acosta/CESAJ-PD-EP
Summa/CESAJ-PD-E

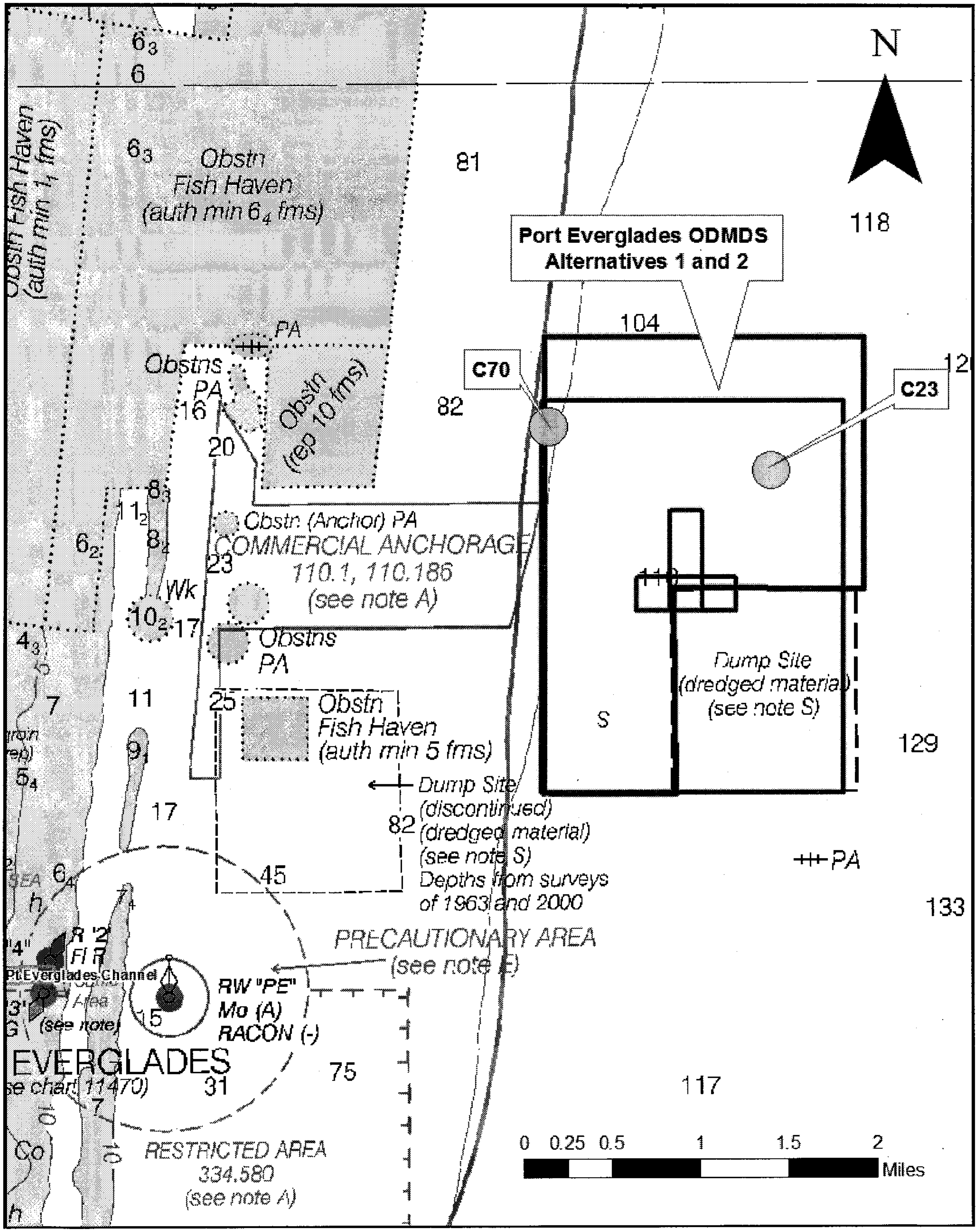


**Figure 1. Location of the Port Everglades ODMDS Alternatives 1 and 2 and Targets C23 and C70.**

FLORIDA DEPARTMENT of STATE

**RICK SCOTT**
Governor

**KEN DETZNER**
Secretary of State

February 4, 2013

Mr. Eric Summa
Department of the Army
Jacksonville District Corps of Engineers
Jacksonville, Florida 32232-0019

Re: DHR Project File No.: 2013-00187 (2011-03638)
Received by DHR: January 10, 2013
1A-32 Permit No.: 1213.016
Draft Report: *Archaeological Identification of Two Targets in the Port Everglades Channel Expansion, Broward County, Florida*

Dear Mr. Summa:

Our office received and reviewed the above referenced draft survey report in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992, and *36 C.F.R., Part 800: Protection of Historic Properties*, and Chapter 267, *Florida Statutes,* for assessment of possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the National Register of Historic Places (NRHP).

In November 2011, Panamerican Consultants, Inc. (PCI) conducted a diver investigation to determine the sources of two clusters of anomalies within the proposed Port Everglades Channel and Ocean Dredged Material Disposal Site (ODMDS) since they could be impacted by the proposed undertaking. The survey was completed on behalf of the US Army Corps of Engineers (Corps). PCI determined that the cultures were modern and did not constitute significant historic properties.

The Corps has determined no historic properties affected by the proposed undertaking and recommends no further investigation of the anomaly clusters.

Based on the information provided, our office concurs with these determinations and finds the submitted draft report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code.*

For any questions concerning our comments, please contact Rudy Westerman, Historic Preservationist, by electronic mail at Rudy.Westerman@DOS.MyFlorida.com, or by phone at 850.245.6333. We appreciate your continued interest in protecting Florida's historic properties.

Sincerely,

Timothy A. Parsons, DSHPO for

Robert F. Bendus, Director
Division of Historical Resources
and State Historic Preservation Officer

# APPENDIX B.

## BIOLOGICAL ASSESSMENT



**DRAFT ENVIRONMENTAL ASSESSMENT
ON THE
EXPANSION OF THE PORT EVERGLADES HARBOR
OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)
BROWARD COUNTY, FLORIDA**

**BIOLOGICAL ASSESSMENT**
**OCEAN DREDGEDMATERIAL DISPOSAL SITE**
**FOR PORT EVERGLADES HARBOR, FLORIDA**

**June 2013**

## Introduction

This Biological Assessment (BA) evaluates the potential impacts to federally listed threatened and endangered species from the proposed expansion of the Port Everglades Ocean Dredged Material Disposal Site (ODMDS), Broward County, Florida. The Environmental Protection Agency (EPA) completed consulation on the original designation of the Port Everglades ODMDS in May 2004, with NMFS determining that the action of disposal of up to 500,000 cubic yards (cy) of dredged materials from Port Everglades harbor was entirely covered by the USACE South Atlantic Regional Biological Opinion (SARBO) issued by NMFS in 1995 and revised on September 25, 1997. Additionally USACE had also consulted on routine operations and maintenance (O&M) in April 2004 and NMFS concluded that there were no expected adverse effects to listed species beyond those already analyzed in the Section 7 consultation for O&M operations completed by USACE in April 2004 (NMFS, ESA consultation letter, Port Everglades ODMDS designation May 24, 2004).

Since the 2004 designation of the Port Everglades ODMDS, two additional ESA consultations for activities associated with dredging at Port Everglades Harbor have been initated by USACE. The first addresses the impacts of O&M dredging in the Port Everglades Channel (I/SER/2012/02289 dated August 8, 2012) with special attention paid to *Acropora* and smalltooth sawfish. NMFS found that the continued O&M dredging of Port Everglades with disposal in the ODMDS, in the existing channel or on the downdrift beaches of John U. Lloyd State Park "may affect, but is not likely to adversely affect listed species" under NMFS jurisdiction. Additionally, USACE has initiaited consualtion with NMFS associated with the expansion of the Port Everglades Federal Navigation project, that consultation was deemed complete by NMFS October 11, 2012. NMFS is currently preparing the Biological Opinion associated with that effort. EPA is the sole consulting agency on the designation of the expanded Port Everglades ODMDS.

For clarification, the operation of dredges and scows transporting materials to the ODMDS has already undergone consultation by USACE in 2004 and again in 2012 for O&M operations (I/SER/2012/02289 dated August 8, 2012) and for expansion dredging operations (pending). Effects on listed species due to either of those operations is incorporated by reference to prevent duplication of effort.

There is a need to expand the existing ODMDS to accommodate the estimated 6.63 million cubic yards of dredged material resulting from the proposed Port Everglades Harbor expansion project. O&M operations are not expected to change in either frequency or in volume and continue to be covered under the consulations completed in 2004 and revised in 2012. Because there are limited options for disposal of dredged material from Port Everglades, offshore disposal of dredge material has been determined to be the most viable option. Recent capacity modeling (Figure 1) indicates the existing, approved ODMDS is insufficient in size to contain the proposed dredged material associated with the proposed Port Everglades expansion project. The need for ocean disposal is based primarily on the lack of economically, logistically, and environmentally feasible alternatives, as evaluated under EPA's General and Specific Criteria for Designation of Ocean Disposal Sites, for the disposal of the projected quantities of dredged material deemed unsuitable for beach placement.


| Approximate Height Above Existing Grade | | | |
|---|---|---|---|
| RANGE | MIN HEIGHT (CM) | MAX HEIGHT (CM) | COLOR |
| 1 | 1.0 | 5.0 | |
| 2 | 5.0 | 10 | |
| 3 | 10 | 30 | |
| 4 | 30 | 300 | |
| 5 | 300 | 600 | |
| 6 | 600 | 900 | |
| 7 | 900 | 950 | |

Figure 1. MDFATE and STFATE capacity modeling conducted by Taylor Engineering (Taylor 2010) shows simulated dredged material exceeding the boundaries of the Port Everglades ODMDS.

A secondary need for expansion is due to Operations and Maintenance (O&M) material. The original site designation was for up to 500,000 cy of O&M material. In 2005, approximately 60,000 cy of dredged material was placed in the existing ODMDS via a release zone in the middle of the site. A 2006 post-disposal monitoring survey showed dredged material was observed to have exceeded the existing site's northern boundary, forming an uneven ellipse elongated in a north-south direction (Germano & Associates, Inc. 2006). Figure 2 shows extent and thickness of dredged material within and exceeding the Port Everglades ODMDS to the north of the site. Based on the results of this survey, the disposal release zone was moved to the southern end of the site to accommodate for the strong northern Florida Current/Gulf Stream current. USACE has scheduled an O&M dredging event to begin in early 2013 of approximately six times more dredged material than in 2005. EPA is planning a post disposal monitoring event in 2014. The monitoring will determine if movement of the disposal release zone to the south is sufficient to contain all material within the existing ODMDS boundaries. If the movement is not sufficient to contain the dredged material, EPA will be required to expand the site in response to the results of the monitoring to accommodate future O&M events of similar magnitude. The 2006 monitoring results suggest that the size of original site may be insufficient to contain the amount of dredged material being placed in the pending O&M event, and that even with the movement of the disposal zone, expansion of the Port Everglades ODMDS may be required in the future.

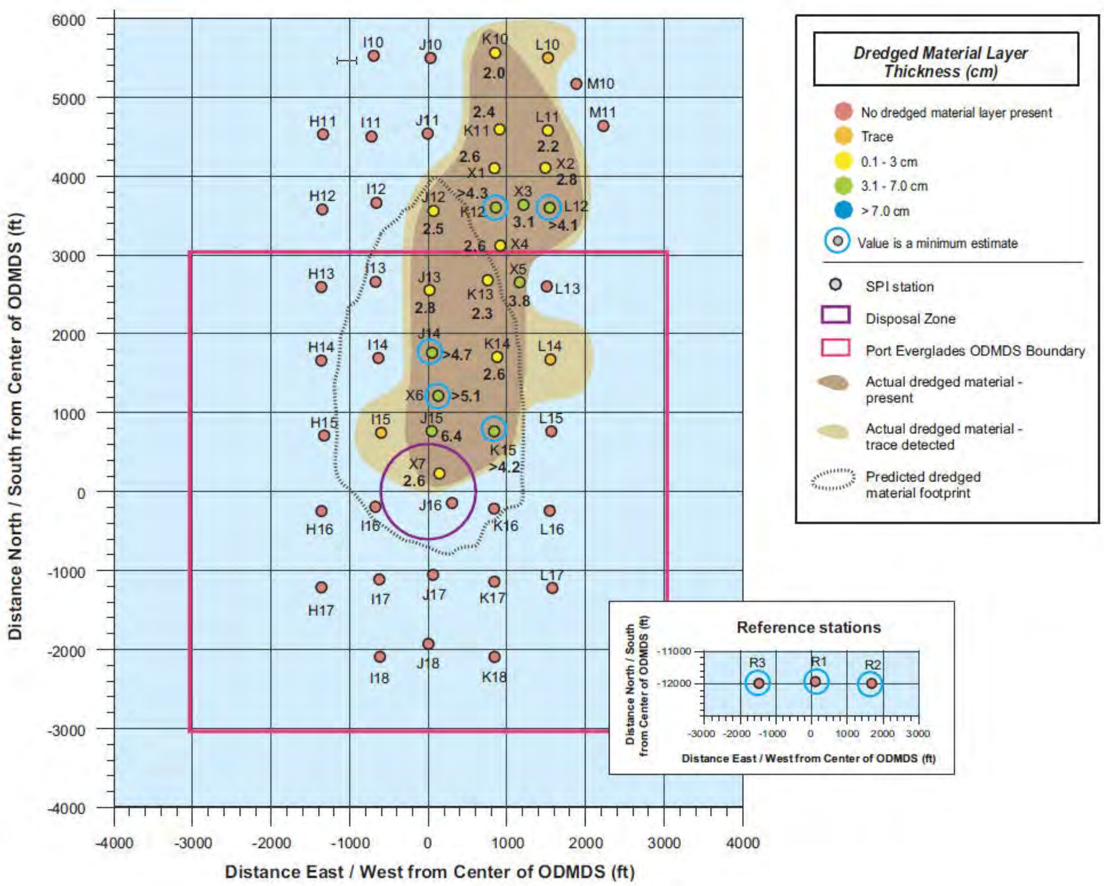


Figure 2. Actual distribution of dredged material based on analysis of sediment profile images as compared with modeled results for the Port Everglades ODMDS (Germano & Associates, Inc. 2006).

As previously stated, this BA only addresses the proposed expansion of the existing ODMDS. Site designation does not authorize use or disposal of dredged material in the ODMDS. Each disposal event will require evaluation for suitability for utilization of the ODMDS. This will include an analysis for the need for ocean disposal, compliance with the Ocean Dumping Criteria and compliance with the current approved Site Management and Monitoring Plan (SMMP). An SMMP was prepared in 2004; updated in May 2009 and will be modified with the site expansion.

**Study Description/Action Area**

Two candidate ODMDS expansion sites of similar configuration, located off the Atlantic coast of Florida, are under consideration (Figure 3). The western edge of the Alternative Site #1 is located in federal waters approximately 3.3 nautical miles (nmi) and the western edge of Site #2 is approximately 3.2 nmi offshore of Ft. Lauderdale on the upper continental slope along the western edge of the Florida Current. The center of Site #1 is approximately 4nmi and the center of Site #2 is approximatel 3.9 nmi offshore of Ft. Lauderdale. Coordinates for the existing Port Everglades ODMDS and two candidate Alternaive sites are given in Table 1. These sites consist of primarily soft-bottom habitat in water depths of 604 ft. (184 m) to 735 ft. (224 m). Alternative 1 is a 3.21 square nmi area resulting from a north-south oriented release zone (Figure 4). Alternative 2 is a 2.89 square nmi site with an east-west oriented release zone (Figure 5). A previously designated ODMDS of approximately 1 square nmi is located within the boundaries of the two candidate sites. The USEPA formally designated the location of the Port Everglades ODMDS in 2005 and the site was used in 2005 for disposal of O&M material by USACE.

Table 1: Existing ODMDS, Alternative Sites 1 and 2 Boundary Coordinates, and corresponding site area.

| Site | | Geographic (NAD83, Decimal Degrees) | | State Plane (Florida East NAD83) | | Area $nmi^2$ |
|---|---|---|---|---|---|---|
| | | X | Y | N | E | |
| Existing ODMDS | SE | 26°06.500’ | -80°01.000’ | 646284.00 | 978856.00 | 0.90 |
| | SW | 26°06.500’ | -80°02.000’ | 646243.00 | 973386.00 | |
| | NW | 26°07.500’ | -80°02.000’ | 652301.00 | 973341.00 | |
| | NE | 26°07.500’ | -80°01.000’ | 652342.00 | 978810.00 | |
| | | | | | | |
| Alternative Site 1 | SE | 26°06.493’ | -80°01.000’ | 646242.90 | 978855.70 | 3.21 |
| | SW | 26°06.504’ | -80°02.586’ | 646242.90 | 970178.00 | |
| | NW | 26°08.756’ | -80°02.568’ | 659889.00 | 970178.00 | |
| | NE | 26°08.746’ | -80°00.981’ | 659889.00 | 978855.70 | |
| | | | | | | |
| Alternative Site 2 | SE | 26°06.493’ | -80°01.000’ | 646242.90 | 978855.70 | 2.89 |
| | SW | 26°06.504’ | -80°02.666’ | 646242.90 | 969745.00 | |
| | NW | 26°08.434’ | -80°02.650’ | 657932.00 | 969745.00 | |
| | NE | 26°08.423’ | -80°00.984’ | 657932.00 | 978855.70 | |

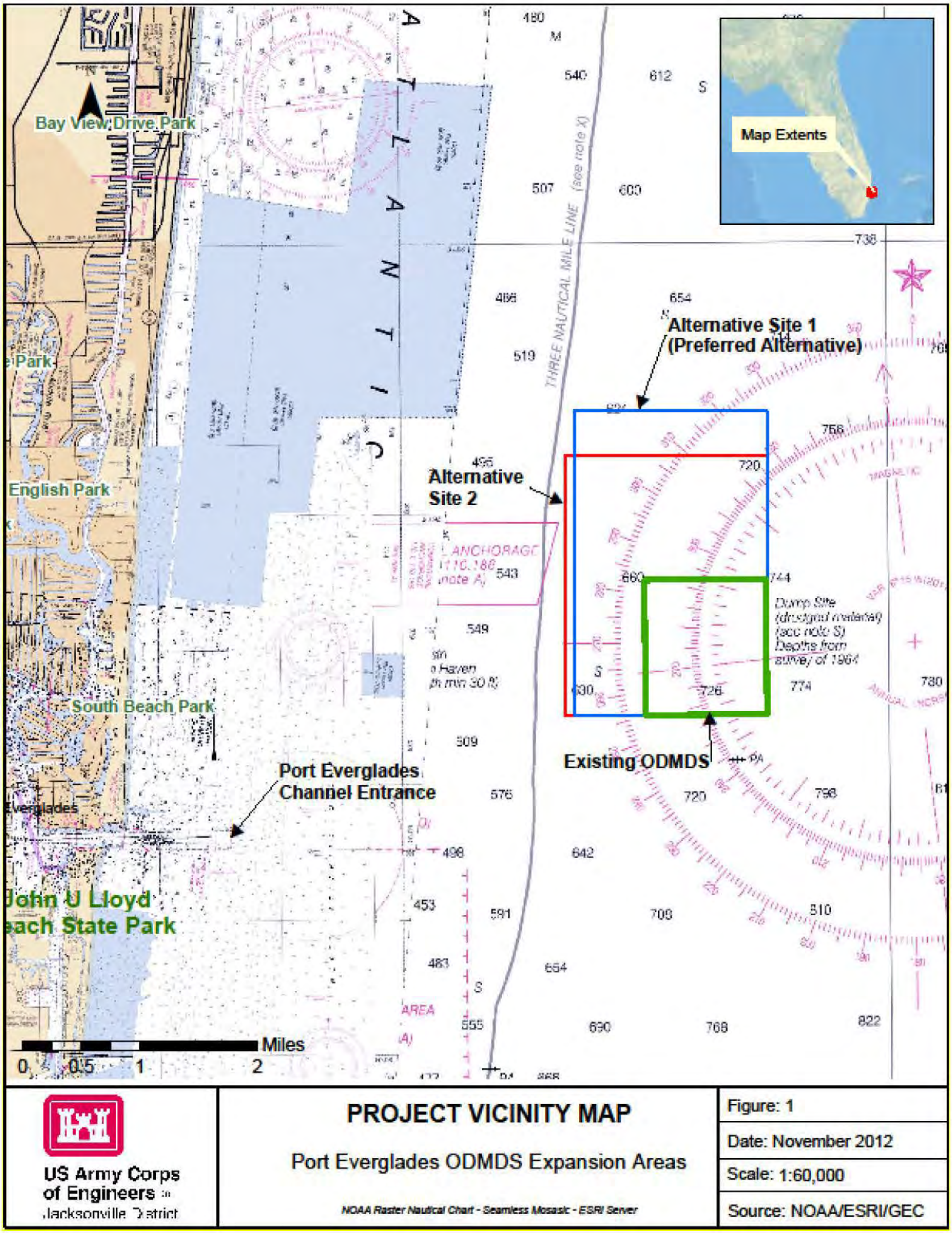


Figure 3. Project vicinity map.

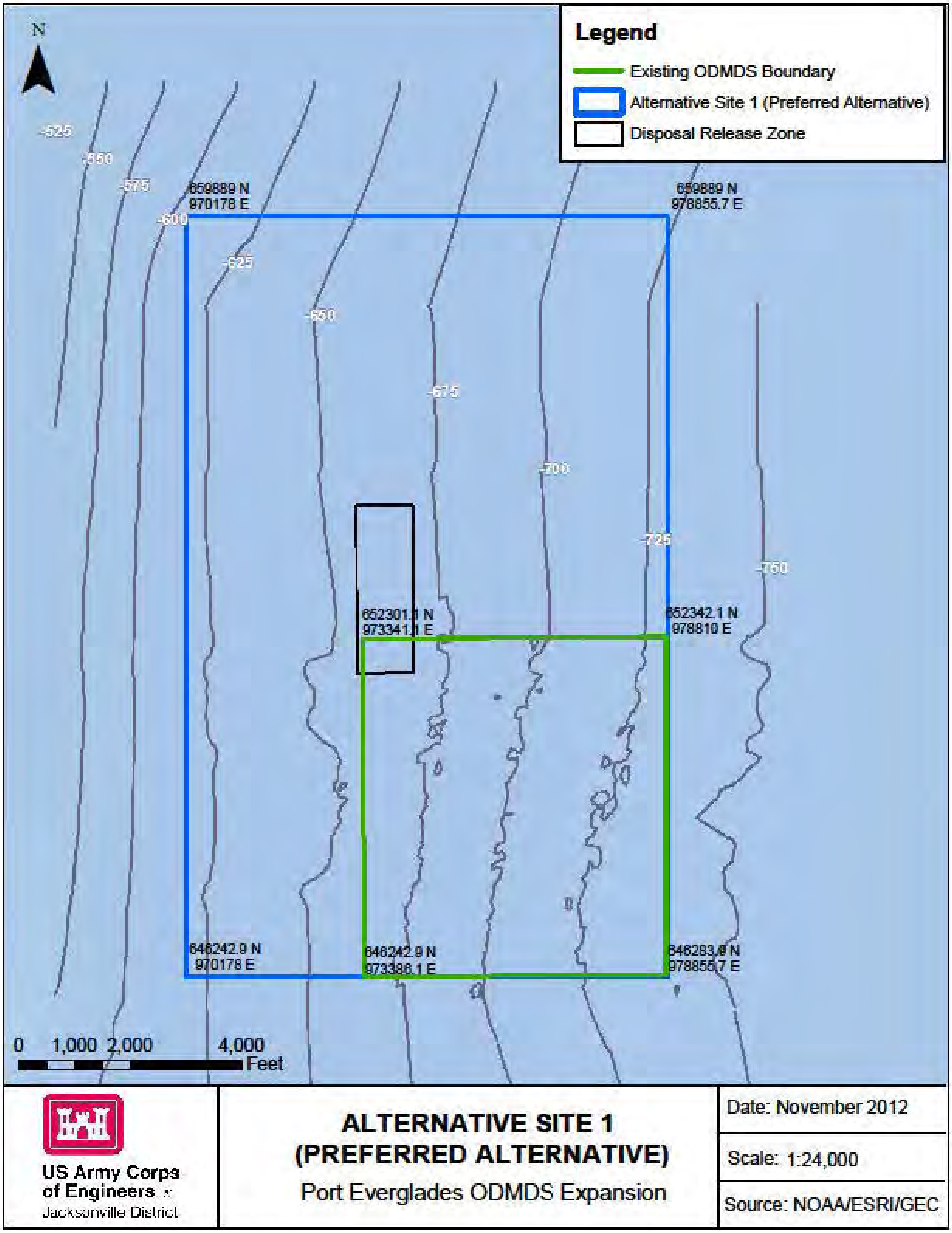

Figure 4. Alternative 1 ODMDS Expansion

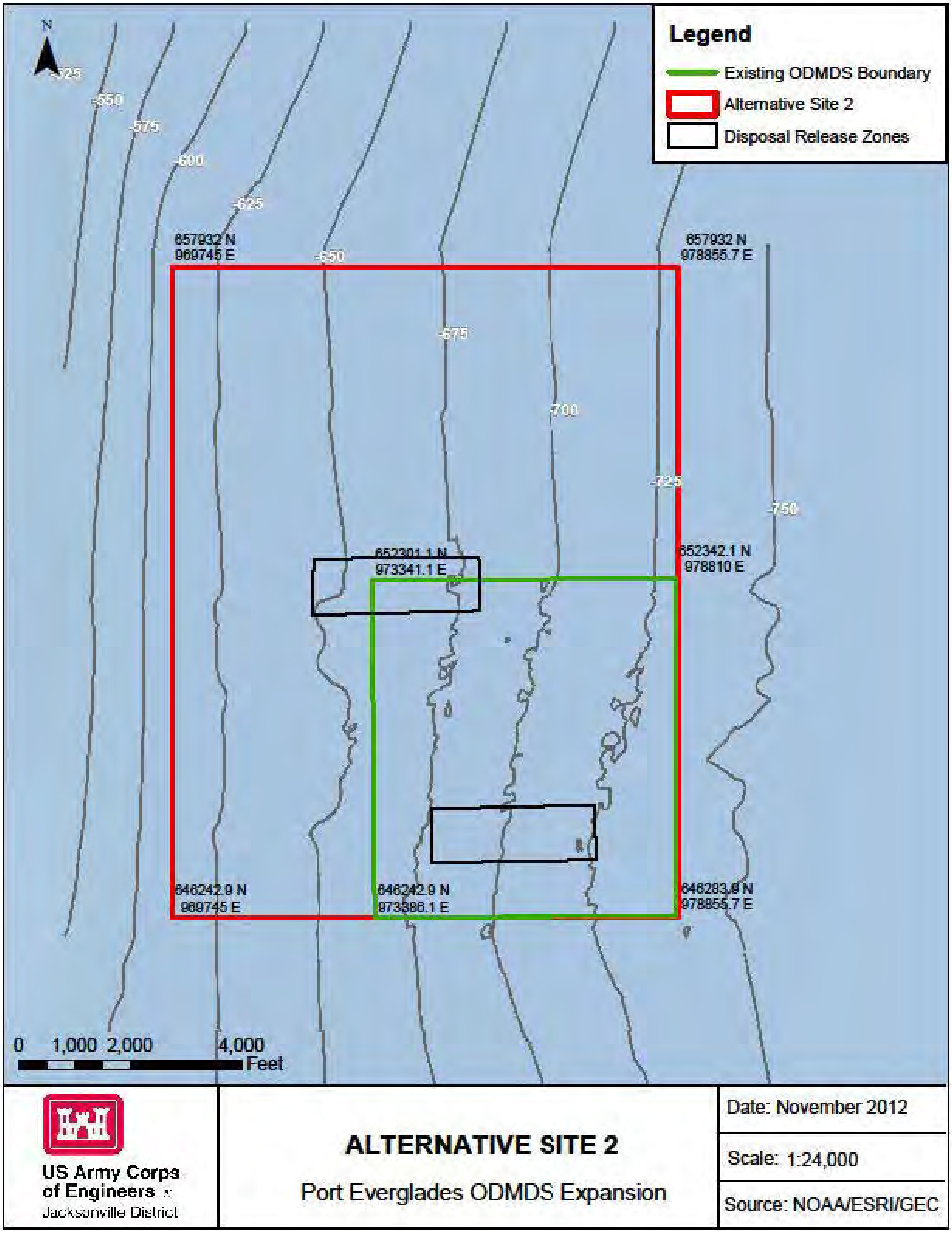


Figure 5. Alternative 2 ODMDS Expansion

**<u>Threatened/Endangered Species and Critical Habitat That May Be Affected By the Proposed Action</u>**

Table 2 presents a list of the threatened and endangered species that may inhabit or occur within the general project area, under NOAA Fisheries jurisiction. Currently, no critical habitat has been designated in the study area.

**Table 2. Threatened and Endangered Species That May Inhabit or Occur Within the Project Area and Transportation Corridor.**

| Listed Species | Scientific Name | Status | Date Listed |
|---|---|---|---|
| **Marine Mammals** | | | |
| Blue whale | *Balaenoptera musculus* | Endangered | 12/02/1970 |
| Fin whale | *Balaenoptera physalus* | Endangered | 12/02/1970 |
| Humpback whale | *Megaptera novaeangliae* | Endangered | 12/02/1970 |
| Right whale | *Eubalaena glacialis* | Endangered | 12/02/1970 |
| Sei whale | *Balaenopera borealis* | Endangered | 12/02/1970 |
| Sperm whale | *Physeter macrocephalus* | Endangered | 12/02/1970 |
| **Sea Turtles** | | | |
| Green sea turtle | *Chelonia mydas* | Endangered (1) | 07/28/1978 |
| Hawksbill sea turtle | *Eretmochelys imbricate* | Endangered | 06/02/1970 |
| Kemp's ridley sea turtle | *Lepidochelys kempii* | Endangered | 12/02/1970 |
| Leatherback sea turtle | *Dermochelys coriacea* | Endangered | 06/02/1790 |
| Loggerhead sea turtle | *Caretta caretta* | Threatened | 07/28/1978 |
| **Fish** | | | |
| Smalltooth sawfish | *Pristis pectinata* | Endangered | 04/01/2003 |
| **Marine Invertebrates** | | | |
| Elkhorn Coral | *Acropora palmata* | Threatened | 05/09/2006 |
| Staghorn Coral | *Acropora cervicornis* | Threatened | 05/09/2006 |

Source: NMFS, 2012

<u>Blue whale.</u> The blue whale (*Balaenoptera musculus* ) is best considered as an occasional visitor in the U.S. EEZ waters, which may represent the current southern limit of its feeding range (CETAP 1982; Wenzel, *et al*. 1988; Yochem and Leatherwood 1985). Summarized records suggested an occurrence of this species south to Florida and the Gulf of Mexico, although the actual southern limit of the species' range is unknown.

Using the U.S. Navy's Sound Surveillance System (SOSUS) program, blue whales have been detected and tracked acoustically in much of the North Atlantic, including in subtropical waters north of the West Indies and in deep water east of the U.S. EEZ (Clark 1995). Most of the acoustic detections were around the Grand Banks area of Newfoundland and west of the British Isles. Sigurjónsson and Gunnlaugsson (1990) note that North Atlantic blue whales appear to have been depleted by commercial whaling to such an extent that they remain rare in some formerly important habitats, notably in the northern and northeastern North Atlantic.

As of NMFS November 2010 Stock Assessment report on the western north Atlantic stock of blue whales, little was known about the population size of the blue whales except for the Gulf of St. Lawrence area. Three-hundred eight animals were documented by Sears *et al* in 1987. The minimum population estimate for the western north Atlantic stock is 308. According to the stock assessment, there are insufficient data to determine population trends for this species. Because the minimum population estimate for the western Atlantic stock of blue whales is more than 10 years old, a Potential Biological Removal (PBR) cannot be calculated. A review of the "Large

Whale Ship Strike Database" (Jensen and Silber 2003) found no recorded ship strikes of blue whales in Florida.

More detailed information on blue whales can be located in the NMFS Stock Assessment reports under the MMPA (http://www.nmfs.noaa.gov/pr/sars/species.htm) and the "Final Recovery Plan for Blue Whale (*Balaenoptera musculus*) July 1998" (http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale_blue.pdf). In April 2012, NMFS published a notice of intent to update the Blue Whale Recovery Plan (77 FR 22760).

Fin whale. The fin whale (*Balaenoptera physalus)* is ubiquitous in the North Atlantic and occurs from the Gulf of Mexico (GOM) and Mediterranean Sea northward to the edges of the Arctic ice pack (Waring, *et al*. 1999). The IWC has proposed a stock boundary for the north Atlantic fin whale, currently all fin whales in the north Atlantic are believed to constitute one stock. This may change with future study. Based on acoustic recordings from hydrophone arrays, Clark (1995) reported a general southward "flow pattern" of fin whales in the fall from the Labrador/Newfoundland region, south past Bermuda, and into the West Indies. The overall distribution may be based on prey availability. This species preys opportunistically on both invertebrates and fish. Fin whales are larger and faster than humpback and right whales and are less concentrated in nearshore environments.

As of NMFS December 2009 Stock Assessment report on the north Atlantic stock of fin whales, the best abundance estimate available for the western North Atlantic fin whale stock is 2,269 (CV= 0.37). Per the stock assessment report, this estimate must be considered extremely conservative in view of the incomplete coverage of the known habitat of the stock and the uncertainties regarding population structure and whale movements between surveyed and unsurveyed areas. The abundance estimates of fin whales include a percentage of the estimate of animals identified as fin/sei whales (the two species being sometimes hard to distinguish). The percentage used is the ratio of positively identified fin whales to the total number of positively identified fin whales and positively identified sei whales. According to the stock assessment, there are insufficient data to determine population trends for this species. PBR for the Gulf of Maine humpback whale is calculated to be 3.4 whales. A review of the "Large Whale Ship Strike Database" (Jensen and Silber, 2003) found no recorded ship strikes of fin whales in Florida.

More detailed information on fin whales can be located in the NMFS Stock Assessment reports under the MMPA (http://www.nmfs.noaa.gov/pr/sars/species.htm) and the "Final Recovery Plan for Fin Whale (*Balaenoptera physalus*) July 2010" (http://www.nmfs.noaa.gov/pr/pdfs/recovery/finwhale.pdf).

Humpback whale. Humpback whales (*Megaptera novaeangliae)* feed in the northwestern Atlantic during the summer months and migrate to calving and mating areas in the Caribbean. Five separate feeding areas are utilized in northern waters after their return; one of which, the Gulf of Maine feeding population, lies within U.S. waters and is the stock of humpback whales that are in the project area. Most of the humpbacks that forage in the Gulf of Maine visit Stellwagen Bank and the waters of Massachusetts and Cape Cod bays. Sightings are most frequent from mid-March through November between 41degrees N and 43 degrees N, from the Great South Channel north along the outside of Cape Cod to Stellwagen Bank and Jeffreys Ledge (CeTAP 1982), and peak in May and August. Small numbers of individuals may be present in this area year-round, including the waters of Stellwagen Bank. Humpback whales pass close to the south Florida coast while migrating from northern feeding waters to mating and calving locations in the Caribbean in the fall and on the return to the north in the spring.

As of NMFS December 2009 Stock Assessment report on the Gulf of Maine stock (formerly the North Atlantic population) of humpback whales, the stock is currently estimated to be 4,894 males (95% CI=3,374-7,123) and 2,804 females (95% CI=1,776-4,463). The minimum population estimate for the Gulf of Maine stock is 549. According to the stock assessment, current data suggests that the Gulf of Maine stock is steadily increasing in size. PBR for the Gulf of Maine humpback whale is calculated to be 1.3 whales. A review of the "Large Whale Ship Strike Database" (Jensen and Silber, 2003) found no recorded ship strikes of humpback whales in Florida.

More detailed information on humpback whales can be located in the NMFS Stock Assessment reports (http://www.nmfs.noaa.gov/pr/sars/species.htm) and the Recovery Plan for Humpback Whale (http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale_humpback.pdf).

<u>North Atlantic Right whale</u>. The North Atlantic right whale (*Eubalaena glacialis*) (NARW) is a federally listed endangered species and is also listed as a depleted stock under the MMPA. The minimum estimated population within the north Atlantic Region is 239 animals (NARC 2010). This estimate is based solely on the whales cataloged as alive in 2009 in the New England Aquarium's (NEA) right whale identification catalog. The conservative middle estimate of population is 473 individual whales. This is based on the 2009 survey data which is the sum of the 330 cataloged whales presumed alive in 2009, the 16 "intermatch" whales that were likely to be added to the catalog, 18 calves from 2008 to 2009 that were also likely to be added to the catalog. The high estimate of the current population of north Atlantic right whales is 581 individuals. This is a sum, based on 2009 survey data, of the 581 cataloged whales, minus known dead individuals; 30 active intermatch animals without calves and 29 calves (2008 and 2009 calves) minus the known dead. These numbers are based on completed analysis of 2009 survey data as of October 31, 2010 and were presented at the annual Right Whale Consortium meeting held in New Bedford, MA during November 2010 (http://www.rightwhaleweb.org/pdf/2010_report_card_addendum.pdf). In 2009, a total of 19 calves were documented, resulting in an average calving interval for the 2009 calving mothers of 3.3 years. There were also four new mothers.

As of NMFS December 2009 Stock Assessment report on the NARW, the minimum population size is currently estimated at approximately 345 animals known alive in 2007 (based on the NE Aquarium sighting catalog). No estimate of abundance with an associated coefficient of variability is available. PBR for the western Atlantic right whale is calculated to be zero whales.

NARWs are highly migratory, summering in feeding and nursery grounds in New England waters and northward to the Bay of Fundy and the Scotian Shelf (NMFS 2005a). They migrate southward in winter to the northeastern coast of Florida. The breeding and calving grounds for the right whale occur off of the coast of southern Georgia and north Florida and have been designated as critical habitat under the ESA in 1994 (59 FR 28793). During these winter months, NARWs are routinely seen close to shore in the critical habitat area. There have been two recent sightings of NARWs that must have transited along the east coast of Florida past Port Everglades. The first was a mother/calf pair (#2360 and calf – New England Aquarium Right

Whale Database) sighted north of the Port of Miami on January 30, 2004 swimming toward the south and was later seen on several occasions between March 19 and April 9, 2004 in the Gulf of Mexico offshore of Panama City, Florida. These two animals were re-sighted in the Great South Channel near Massachusetts in May 2004. In December 2005, another mother/calf pair NARW that was seen off central Florida and later documented in the Corpus Christi ship channel, Corpus Christi, Texas in January 2006. This mother was also confirmed as being a member of the north Atlantic stock, NARW # 2503 and her calf. These two animals were re-sighted in the Bay of Fundy in the summer of 2006 (Amy Knowlton, New England Aquarium, 2008 pers. comm.) These sightings mean that these two right whales and their calves passed by Port Everglades not once, but twice during their transit to and from the Gulf of Mexico. While NARWs have been historically reported in south Florida and the Gulf of Mexico, these sightings are extremely rare (Dan O'Dell, Hubbs-Sea World Research Institute, 2002, personal communication; North Atlantic Right Whale Consortium database, University of Rhode Island, accessed January 2008). Since 2004, three additional sightings of NARW have occurred off of Palm Beach and Broward counties, all north of Port Everglades: January 2010; a NARW was reported by the hopper dredge *RN Weeks* in the Jupiter Inlet/West Palm Beach area; early January 2011; West Palm Beach, FL; a NARW was spotted and filmed by divers off West Palm Beach and January 20, 2011; Fort Lauderdale, FL, an entangled female NARW (confirmed as whale #3911 in the NEA NARW catalog) was documented in the Fort Lauderdale area. Attempts were made to disentangle this animal, and this whale died a couple of weeks after the disentanglement (Audra Livergood, pers comm., 2011).

A review of the “Large Whale Ship Strike Database” (Jensen and Silber, 2003) found five recorded ship strikes of NARWs from 1975 through 2002 offshore of Florida, all occurring between Fernandina Beach and Jacksonville. There have been at least two additional ship strikes (one in 2003 and one in 2006) in that same area since 2002. No records of ship strike of any right whales have been reported in southeast Florida (Jensen and Silber 2003).

A complete assessment of NARW recovery efforts and activities is reviewed in the Recovery Plan for the “North Atlantic Right Whale (*Eubalaena glacialis*)” (NMFS 2005) http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale_right_northatlantic.pdf.

Sei whale. Indications are that, at least during the feeding season, a major portion of the sei whale (*Balaenoptera borealis)* population is centered in Northerly waters, perhaps on the Scotian Shelf (Mitchell and Chapman 1977). The southern portion of the species' range during spring and summer includes the northern portions of the U.S. EEZ; the Gulf of Maine and Georges Bank. The period of greatest abundance there is in spring, with sightings concentrated along the eastern margin of Georges Bank and into the Northeast Channel area, and along the southwestern edge of Georges Bank in the area of Hydrographer Canyon (CETAP 1982). The sei whale is generally found in the deeper waters characteristic of the continental shelf edge region. Mitchell (1975) similarly reported that sei whales off Nova Scotia were often distributed closer to the 2,000 m depth contour than were fin whales.

This general offshore pattern of sei whale distribution is disrupted during episodic incursions into more shallow and inshore waters. The sei whale, like the right whale, is largely planktivorous — feeding primarily on euphausiids and copepods. In years of reduced predation on copepods by other predators, and thus greater abundance of this prey source, sei whales are reported in more inshore locations, such as the Great South Channel (in 1987 and 1989) and

Stellwagen Bank (in 1986) areas (R.D. Kenney, pers. comm.; Payne, *et al*. 1990). An influx of sei whales into the southern Gulf of Maine occurred in the summer of 1986 (Schilling, *et al*. 1992). Such episodes, often punctuated by years or even decades of absence from an area, have been reported for sei whales from various places worldwide.

According to the NMFS December 2009 Stock Assessment report on the Nova Scotia stock of sei whales, the size of the population of whales in the U.S. EEZ is unknown. However, five abundance estimates are available for portions of the sei whale habitat: from Nova Scotia during the 1970's, in the U.S. EEZ during the springs of 1979-1981, and in the U.S. and Canadian Atlantic EEZ during the summers of 2002, 2004, and 2006. The August 2004 abundance estimate (386) is considered the best available for the Nova Scotia stock of sei whales. However, this estimate must be considered conservative in view of the known range of the sei whale in the entire western North Atlantic, and the uncertainties regarding population structure and whale movements between surveyed and unsurveyed areas. The abundance estimates of sei whales include a percentage of the estimate of animals identified as fin/sei whales (the two species being sometimes hard to distinguish). The percentage used is the ratio of positively identified sei whales to the total of positively identified fin whales and positively identified sei whales.. PBR for the Nova Scotia stock of the sei whale is 0.4. A review of the “Large Whale Ship Strike Database” (Jensen and Silber 2003) found no recorded ship strikes of sei whales in Florida.

More detailed information on sei whales can be located in the NMFS Stock Assessment reports under the MMPA (http://www.nmfs.noaa.gov/pr/sars/species.htm).

NMFS published a recovery plan for Sei whale in December 2011 (http://www.nmfs.noaa.gov/pr/pdfs/recovery/seiwhale.pdf).

Sperm whale Currently, there is not a good estimate for the total number of sperm whales ((*Physeter macrocephalus*) worldwide. The best estimate, that there are between 200,000 and 1,500,000 sperm whales, is based on extrapolations from only a few areas that have useful estimates. In the western North Atlantic they range from Greenland to the Gulf of Mexico and the Caribbean. The sperm whales that occur in the eastern U.S. Atlantic Exclusive Economic Zone (U.S. EEZ) are believed to represent only a portion of the total stock (Blaylock *et al*. 1995). Sperm whales generally occur in waters greater than 180 meters in depth. While they may be encountered almost anywhere on the high seas their distribution shows a preference for continental margins, sea mounts, and areas of upwelling, where food is abundant (Leatherwood and Reeves 1983). Waring, *et al*. (1993) suggest sperm whale distribution is closely correlated with the Gulf Stream edge. Like swordfish, which feed on similar prey, sperm whales migrate to higher latitudes during summer months, when they are concentrated east and northeast of Cape Hatteras. Bull sperm whales migrate much farther poleward than the cows, calves, and young males. Because most of the breeding herds are confined almost exclusively to warmer waters many of the larger mature males return in the winter to the lower latitudes to breed.

As of the NMFS October 2007 Stock Assessment report on the North Atlantic Stock of sperm whales, the population is currently estimated at approximately 4,804 (CV=0.38), a combination of the north U.S. Atlantic stock (2,607) and the south U.S. Atlantic stock (2,197). According to the stock assessment, there is insufficient data to determine the population trend for the species. PBR for the western North Atlantic sperm whale is calculated to be 7.1 whales. A review of the

"Large Whale Ship Strike Database" (Jensen and Silber 2003) found no recorded ship strikes of sperm whales in Florida.

More detailed information on sperm whales can be located in NMFS Stock Assessment reports (http://www.nmfs.noaa.gov/pr/sars/species.htm) and the *Recovery Plan for Sperm Whale* at the following website address:
http://www.nmfs.noaa.gov/pr/pdfs/recovery/final_sperm_whale_recovery_plan_21dec.pdf.

<u>Green sea turtle</u> (*Chelonia mydas*). Adult green sea turtles can measure about 3 feet in length and weigh up to 350 pounds. Green sea turtles are globally distributed within tropical and subtropical waters. Along the Atlantic and Gulf coasts of the US, they can be found from Texas to Massachusetts and around the U.S. Virgin Islands and Puerto Rico. This species utilizes beaches for nesting, coastal areas for feeding and open ocean convergence zones. Threats to green turtles in the open waters associated with the proposed ODMDS sites include entanglement in trawl nets, longlines and lines associated with traps and pots. Green sea turtles may be present within the waters of the proposed expansion areas at various times of the year. Because this species is known to be an agile swimmer, individuals should be capable of avoiding the effects associated with a disposal event in either of the proposed ODMDS sites.

<u>Hawksbill sea turtle</u> (*Eretmochelys imbricata*). Hawksbill sea turtles are small to medium sized. Nesting females average 2 to 3 feet in length and typically weigh up to 200 pounds. The hawksbill sea turtle occurs in the tropical and sub-tropical waters of the Atlantic, Pacific, and Indian Oceans. They are most commonly associated with coral reefs however juveniles are thought to spend time in the pelagic environment. They are observed with regularity on the reefs off of Palm Beach, Broward, Miami-Dade and Monroe Counties where the warm Gulf Stream current passes close to shore. Population estimates and trends are difficult to determine due to its habit of solitary nesting.

<u>Kemp's ridley sea turtle</u> (*Lepidochelys kempii*). Kemp's ridley sea turtle is the smallest of the sea turtles with adults are typically weighing up to 100 pounds in weight and are about 2 feet in length. They can be found mainly in the Gulf of Mexico and along the U.S. Atlantic coast. The Kemp's ridley sea turtle has been in decline many years. In one day of nesting in 1947, approximately 42,000 females were counted on a beach in Mexico. From 1973 to 1991 the number of nests declined to approximately 200 per year. This species is found in submerged habitats where there is muddy or sandy substrate where they feed on crabs, fish and mollusks.

<u>Leatherback sea turtle</u> (*Dermochelys coriacea*). The leatherback is the largest living turtle and reptile in the world. Adult turtles average 5 feet in length but can grow to 6.5 feet and weigh up to 2,000 pounds. Their wide range includes tropical, subtropical and temperate waters of all major oceans where they feed on jellyfish and other soft-bodied prey. A minor nesting area is located along the southeast coast of Florida and individuals are observed in the adjacent offshore waters. There are mixed reports on the overall status of this species.

<u>Loggerhead sea turtle</u> (*Caretta caretta*). Adult loggerhead turtles average 3 feet in length and 250 pounds in weight. These highly migratory turtles can be found worldwide, inhabiting continental shelves, bays, estuaries, and lagoons in temperate, subtropical, and tropical waters.

They are the most abundant sea turtle found in U.S. coastal waters. The loggerhead's range in the Atlantic is from Newfoundland south to Argentina.

Sea turtles show a wide range in diving time, depth and duration. Deepest dive depths have been recorded from adult leatherback turtles (>1000m), followed by the olive ridley (290m) (not found in the project area) and adult female loggerheads (233m). Although hawksbills, green and Kemp's ridley turtles tend to remain in shallow water (from 20 to 50m), a record of 110m has been reported for a green turtle (Lutz and Musick, 1997).

Smalltooth sawfish (*Pristis pectinata*). Adults typically grow to 18 feet and can reach up to 25feet They inhabit shallow water and thus are most likely to be encountered closer to shore in the transportation corridor. This species is known to inhabit the Pacific and Atlantic Oce4ans and the Gulf of Mexico. It is estimated that the population has been reduce by 90% from its peak population. The species inhabits shallow coastal waters and estuaries. It is usually found in shallow waters very close to shore over muddy and sandy bottoms and is often found in sheltered bays, on shallow banks, and in estuaries or river mouths. The smalltooth sawfish feeds primarily on fish, but also ingests crustaceans. The current range of this species has contracted to peninsular Florida, and smalltooth sawfish are relatively common only in the Everglades region at the southern tip of the state.

Elkhorn and Staghorn Coral These Atlantic acroporid coral species' potentially affected environment is the submerged bottom. Both species corals are found typically in shallow water on reefs throughout the Bahamas, Florida and the Caribbean where water temperatures range from 66 to 86°F. Acroporids live in high-energy zones, with a lot of wave action. Corals depend on symbiotic zooxanthellae for food; zooxanthellae need sunlight to photosynthesize.

Elkhorn and staghorn corals generally have the same geographic distribution, with a few exceptions. The maximum northern extent (Palm Beach County, Florida) of staghorn coral occurrence is farther north than that of elkhorn coral (Broward County, Florida). Staghorn coral commonly grows in more protected, deeper water in depths from 5 to 20 m, rarely to 60 m. Elkhorn coral commonly grows in turbulent shallow water on the seaward face of reefs in depths from 1 to 5 m, but has been found to 30 m depth.

Acroporid corals were evaluated for the Port Everglades deepening and widening of the Federal entrance channel (Dial Cordy and Associates, Inc. 2010). No *Acropora* colonies were documented within 150-meters of the channel during this survey (Dial Cordy and Associates, Inc. 2010). *Acropora* colonies were only identified at a few locations within the indirect impact area of the Sand Bypass Project study area (NSUOC 2008). *Acropora* surveys were conducted within the shallow-water (less than 30 m deep) cable conduit area of the South Florida Ocean Measurement Facility (SFOMF) Restricted OPAREA just south of the Port Everglades entrance channel by Gilliam and Walker (2011) (Figure 6). No elkhorn coral colonies were identified; however, staghorn coral was identified at 45 of 376 sites, primarily in depths less than 10 m (Gilliam and Walker 2011).

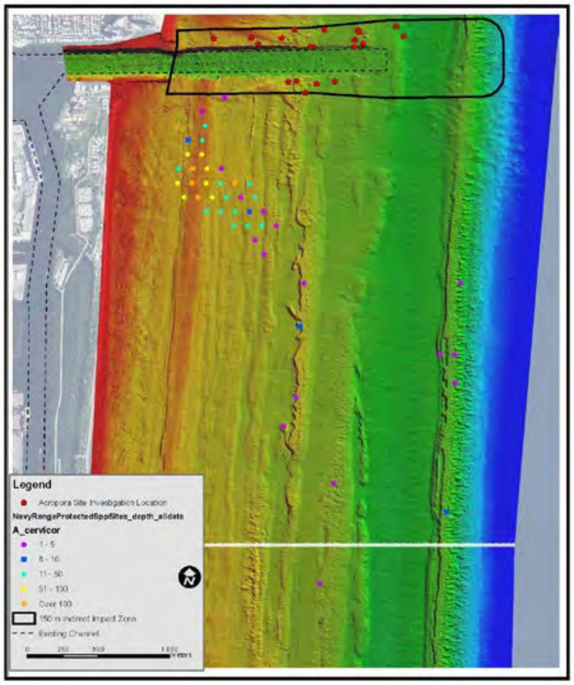


Figure 6 - Location of USN *A. cervicornis* colonies in comparison with Port Everglades Channel.

Critical habitat for elkhorn and staghorn corals in the Florida Unit was designated in 2008 and includes the Atlantic Ocean offshore of Broward County (Figure 7). Within these water depths, NMFS has defined that, ‘‘substrate of suitable quality and availability’’ is equivalent to consolidated hardbottom or dead coral skeleton that is free from fleshy macroalgae cover and sediment cover. (NMFS, 2008).

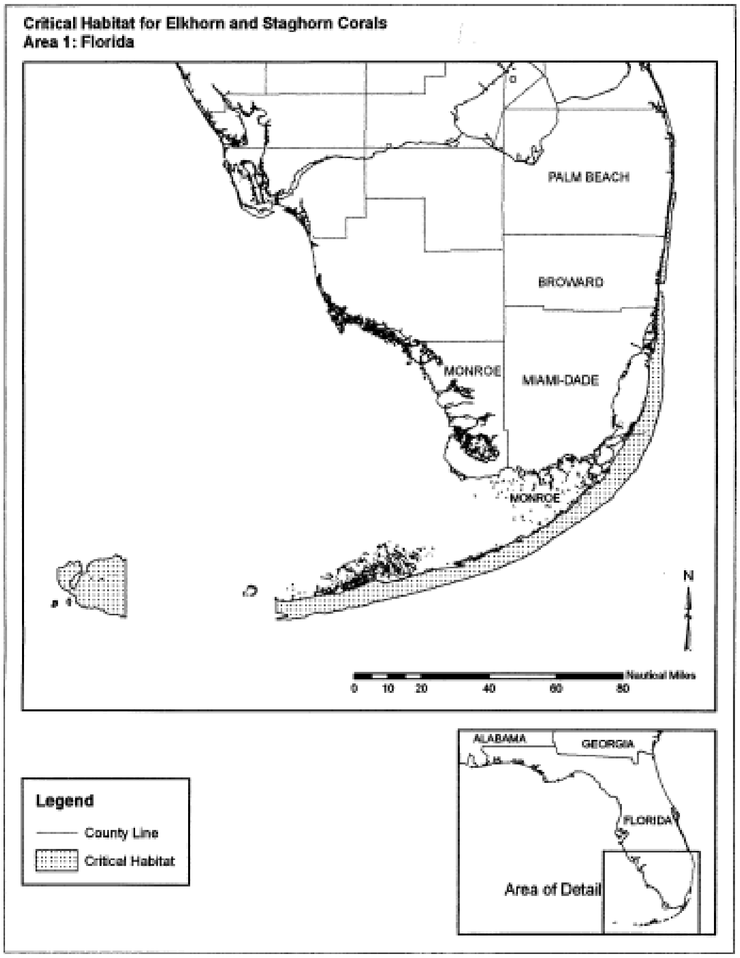


Figure 7 - Designated critical habitat for Elkhorn and staghorn corals in the Florida Area.

The channel walls and bottom are not designated critical habitat (NMFS, 2008) because they are considered part of a "maintained channel" as detailed in 50 CFR §226.216 (c)(2). Also, an area south of Port Everglades referred to as the "Dania RAA" was excluded from the DCH under 50 CFR §226.216(d). This area abuts the south side of the existing federal channel approximately 300 feet south of the channel, creating a 7.45 acre strip of DCH on the south side of the channel. The ODMDS expansion areas are located about 1.8 nmi east of the nearest Acropora critical habitat (Figure 8).

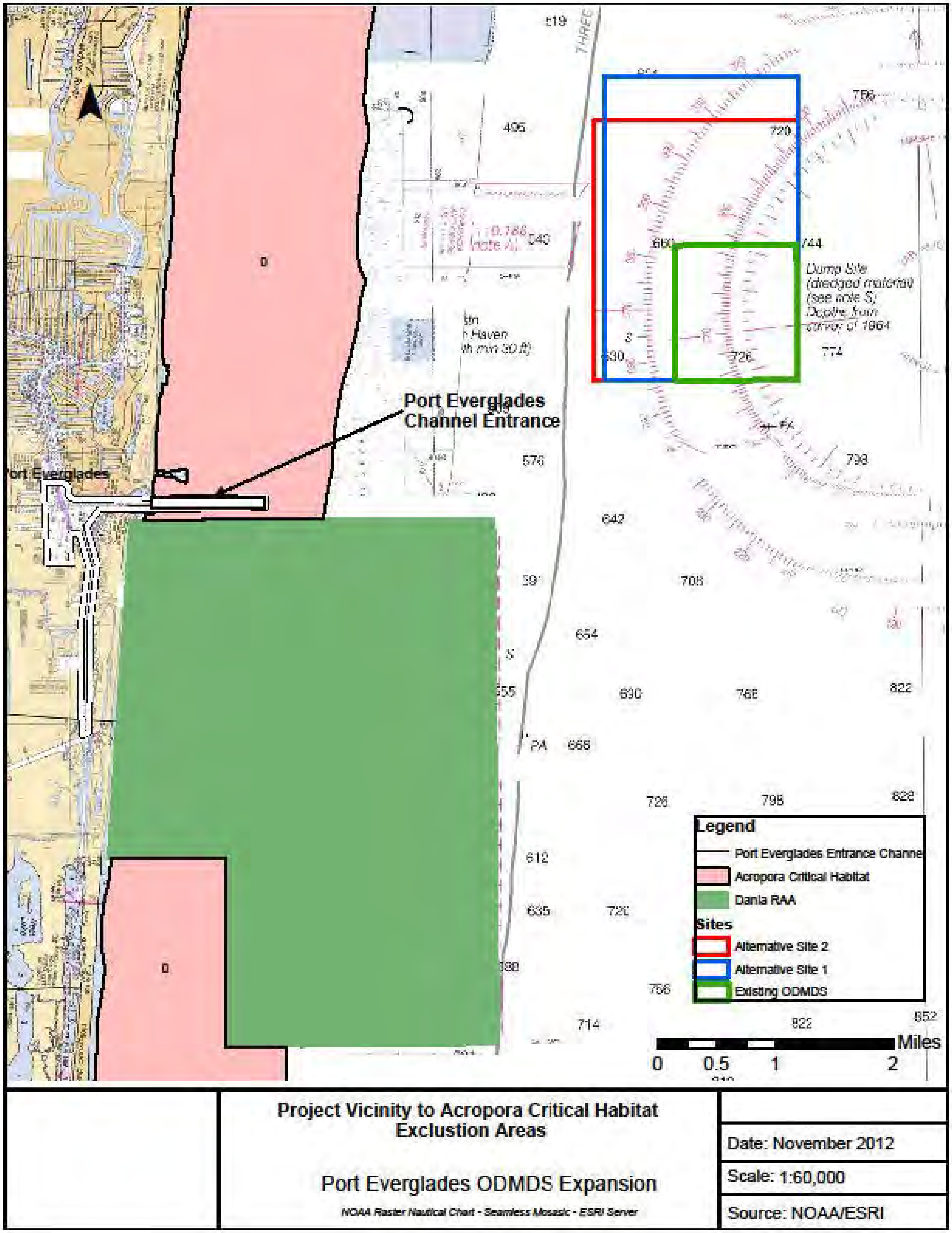


Figure 8 - Designated critical habitat for Elkhorn and staghorn corals offshore of Broward County, including exclusion areas and proposed expansion sites.

## Effects of the Proposed Action

*Effects on Listed Species and Critical Habitat*
As with the original designation of the Port Everglades ODMDS, selection of either expanded ODMDS (east-west release zone or north-south release zone) will either result in no effect to certain species, or may affect, but is not likely to adversely affect any of the threatened and endangered species described in the preceding section.

**Whales**
In the Concurrence letter for the original designation dated May 24, 2004, NOAA Fisheries states "The use of dredges and the disposal of dredged material using a near-instantaneous dumping type barge or scow have not been shown to adversely affect whales, although the RBO requires dredges to maintain a lookout for right whales and carefully avoid them, and reduce speed in limited visibility. During the recently completed Brunswick Harbor Dredging project, onboard observers detected and avoided right whales on numerous occasions when the dredge was operating or in transit to the Brunswick site. Therefore, NOAA Fisheries believes adverse effects to whales are unlikely to occur from the project." As with the project cited by NOAA Fisheries, any disposal operations taking place in the Port Everglades ODMDS will be under the authorization of USACE and are covered by the RBO. The USACE will comply with applicable windows and protective measures for listed species as stated in the most current SARBO. For specific dredging projects not covered by the SARBO, NMFS will be consulted and separate biological opinions may be prepared for those projects. Activities under the SARBO require monitoring and avoidance of large whales during transit to/from disposal sites and during disposal operations. EPA concurs with NOAA Fisheries previous determination and adopts that for this consultation.

**Turtles**
As with whales, sea turtles are high motile animals. NOAA Fisheries has previously reviewed the effects of dredging and disposal operations on the five species of sea turtles that may be in the action area. "Previous NOAA Fisheries' biological opinions issued to the U.S. Army Corps of Engineers in 1991, 1995, 1997, and 2003 have documented that non-hopper type dredges operating in the South Atlantic and Gulf of Mexico are unlikely to adversely affect sea turtles since it is believed that turtles are able to avoid these slower moving dredges. On April 22, 2004, NOAA Fisheries consulted on the routine maintenance dredging of the Port Everglades Federal Navigation Project and concluded that no adverse effects to listed species are expected. NOAA Fisheries believes hopper dredging at Port Everglades Harbor falls is within the scope ofthe general type of hopper dredging activities proposed, described, and analyzed in the September 25, 1997, Regional Biological Opinion (RBO) to the Corp of Engineers' South Atlantic Division which amended the regional opinion conducted in 1995, and superseded the interim biological opinion issued on April9, 1997." As with the project cited by NOAA Fisheries, any disposal operations taking place in the Port Everglades ODMDS will be under the authorization of USACE and are covered by the SARBO. The USACE will comply with applicable windows and protective measures for listed species as stated in the most current SARBO. For specific dredging projects not covered by the SARBO, NMFS will be consulted and separate biological opinions may be prepared for those projects. Activities under the SARBO require monitoring for impacts to sea turtles during transit to/from disposal sites and

during disposal operations. Disposal operations may effect sea turtles swimming in the proposed expansion site by increased turdibity during disposal events. The effect of increased turbidity on sea turtles is expected to be minimal due to the short duration of the reduced water clarity. EPA concurs with NOAA Fisheries previous determination and adopts that for this consulation.

**Sawfish**

In the May 2004 consulation for the original designation of the Port Everglades ODMDS, NOAA Fisheries states "The smalltooth sawfish *(Pristis pectinata)* may also occur off Florida. However, the occurrence of smalltooth sawfish has not been documented within the vicinity of the action area for this project. Therefore, since there is no evidence suggesting smalltooth sawfish occur within the action area, and because these species are highly mobile and likely are to move away from the area during the dredging activities if they happened to be present, we believe no effects to the smalltooth sawfish are likely to occur from the project." EPA concurs with NOAA Fisheries previous determination and adopts that for this consulation.

***Acropora* and Designated critical habitat**

Neither elkhorn coral (*Acropora palmata*) nor staghorn coral (*Acropora cervicornis*) are found in waters exceeding 30 meters (approximately 99 feet) (NMFS, 2005). There are no documented Acroporid corals in the transit path from the existing Port Everglades entrance channel to the proposed ODMDS expansion sites. And per the previously referenced studies, there are no Acroporid corals within 500 feet, north or south, of the existing or proposed expanded channel boundaries. Impacts associated with transit by dredges and or tugs/scows have been/are being consulted on by USACE in association with the Port Everglades expansion project, or the Port Evergladesd ongoing O&M activities. Water depths at either of the proposed expansion sites range from 604-735 feet in depth. This exceeds the maximum recorded depths for either *Acropora* species, and thus, EPA believes the action of designation of the newly expanded site will have no effect on listed Acroporid corals. Designated critical habitat for Acroporid corals extends from mean high water to 30 meters. Both of the proposed sites are in waters that exceed those depths. Designation of an expanded ODMDS at Port Everglades will not adversely modify designated critical habitat for Acroporid corals.

**Table 3. Effects of ODMDS on Threatened and Endangered Species on either Alternative 1 or Alternative 2**

| Species | Scientific Name | Status | Effect |
|---|---|---|---|
| **Marine Mammals** | | | |
| Blue whale | *Balaenoptera musculus* | Endangered | MANLAA |
| Finback whale | *Balaenoptera physalus* | Endangered | MANLAA |
| Humpback whale | *Megaptera novaeangliae* | Endangered | MANLAA |
| Right whale | *Eubalaena glacialis* | Endangered | MANLAA |
| Sei whale | *Balaenopera borealis* | Endangered | MANLAA |
| Sperm whale | *Physeter macrocephalus* | Endangered | MANLAA |
| **Sea Turtles** | | | |
| Green sea turtle | *Chelonia mydas* | Endangered | MANLAA |
| Hawksbill sea turtle | *Eretmochelys imbricate* | Endangered | MANLAA |
| Kemp's ridley sea turtle | *Lepidochelys kempii* | Endangered | MANLAA |
| Leatherback sea turtle | *Dermochelys coriacea* | Endangered | MANLAA |
| Loggerhead sea turtle | *Caretta caretta* | Threatened | MANLAA |
| **Fish** | | | |
| Smalltooth sawfish | *Pristis pectinata* | Endangered | MANLAA |
| **Marine Invertebrates** | | | |
| Elkhorn Coral | *Acropora palmata* | Threatened | No Effect |
| Staghorn Coral | *Acropora cervicornis* | Threatened | No Effect |
| MANLAA = May Affect, Not Likely to Adversely Affect | | | |

## Conservation Measures

Before either proposed expanded ODMDS site can be used, the specific disaposal event that will result in use of the site must be authorized by EPA and may be permited by USACE (for a non-federal disposal activity). The disposal operations shall be required to comply with the disposal criteria and EPA's regulations for ocean disposal, as well as the site specific SMMP (previously discussed).Specifically both EPA and USACE require the dredges/tugs & scows to remain in the marked channel until past the last buoy to avoid potential impacts due to vessel groundings or leakage. The USACE will comply with applicable windows and protective measures for listed species as stated in the most current SARBO. For specific dredging projects not covered by the SARBO, NMFS will be consulted and separate biological opinions may be prepared for those projects. Accordingly, no addition conservation measures are proposed.

## Conclusions

Based on the information presented here, EPA determines that the final designation of an expanded Ocean Dredged Material Disposal Site offshore of Port Everglades, FL, may affect, is not likely to adversely affect the species discussed in this Biological Assessment (Table 3) and will not destroy or adversely modify designated critical habitat and requests that NMFS concur with this determination.

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# APPENDIX C.

## ESSENTIAL FISH HABITAT ASSESSMENT

**DRAFT ENVIRONMENTAL ASSESSMENT**
**ON THE**
**EXPANSION OF THE PORT EVERGLADES HARBOR**
**OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)**
**BROWARD COUNTY, FLORIDA**

# ESSENTIAL FISH HABITAT ASSESSMENT

## Environmental Protection Agency Region 4
## Port Everglades Harbor ODMDS Expansion,
## Fort Lauderdale, Broward County, Florida

**June 2013**

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# 1 PROJECT DESCRIPTION

## 1.1 PURPOSE AND NEED

The Administrator of the U. S. Environmental Protection Agency (USEPA) has the authority to promulgate ocean dumping criteria, designate recommended ocean disposal sites, and issue permits for dumping of materials into ocean waters. Under Sections 102 and 103 of the *Marine Protection, Research, and Sanctuaries Act (MPRSA)* of 1972, as amended (33 U.S.C. 1412), also known as the *Ocean Dumping Act,* USEPA and the U. S. Army Corps of Engineers (USACE) have the responsibility for ensuring that ocean dredged material disposal activities will not unreasonably degrade or endanger human health, welfare, amenities, or the marine environment.

Section 102 of the MPRSA authorizes USEPA to designate sites or times at which dumping may occur and establish criteria for reviewing and evaluating permit applications. It also requires USEPA, in conjunction with USACE, to develop site management and monitoring plans (SMMPs) for dredged material disposal sites. Section 103 of the MPRSA authorizes USACE to issue permits for the transportation of dredged material, subject to compliance with the USEPA environmental criteria (Ocean Dumping Criteria at 40 CFR Part 227) and USEPA concurrence with USACE's finding of compliance. Section 103(b) authorizes USACE, with USEPA concurrence, to select alternative project sites of limited duration for disposal of dredged material in ocean waters when the use of a site designated by USEPA is not feasible.

It is the USEPA's policy to prepare a *National Environmental Policy Act (NEPA)* document for all Ocean Dredged Material Disposal Site (ODMDS) designations (63 FR 58045, October 1998). The Port Everglades Harbor ODMDS was designated by USEPA Region 4 in February 2005 (70 FR 2808, 1/18/2005). A Final Environmental Impact Statement (FEIS) in support of designation was published in July 2004. . An EFH Assessment dated October 2004 was completed as part of EPA's EFH consultation for that designation. That Assessment is incorporated by reference in this Assessment and is included as an appendix for reference. The November 2004 Port Everglades Harbor ODMDS SMMP placed project volume restrictions of 500,000 cubic yards (cy) per dredging event until capacity modeling was completed. In 2009, the USACE initiated capacity modeling for the proposed Port Everglades expansion project. Preliminary results have indicated that the existing ODMDS is insufficient in size to contain the potential volume of dredged material from this project. Therefore, the USACE has determined that there is a need to enlarge the existing ODMDS and is working cooperatively with the USEPA in the development of an Environmental Assessment (EA) supporting the ODMDS expansion. Per the regulations at 50 CFR 1502.20, EPA is tiering the NEPA analysis associated with the expansion off of the 2004 EIS for designation of the original site. The regulations state that the federal agency shall tier "to eliminate repetitive discussions of the same issues and focus on the actual issues ripe for decision at each level of environmental review."

The transportation of dredged material for the purpose of disposal into ocean waters (i.e. the actual use of the designated site) is permitted by the USACE or authorized in the case of federal Civil Works navigation projects under Section 103 of the MPRSA after applying environmental criteria established in EPA's Ocean Dumping Regulations (40 CFR 227). Therefore, the proposed action is the selection and designation of the Port Everglades Harbor ODMDS and not the permitting or authorization for use of the site.

The action area (or region of influence [ROI]) is defined as the geographic area in which EFH species could potentially be affected by the proposed action. The action area includes marine areas in the vicinity of the ODMDS expansion areas.

The existing Port Everglades Harbor ODMDS is an area approximately one square nmi located approximately 4 nautical miles (nmi) east northeast of Port Everglades (Figure 1). The western edge of the site is located 3.8 nmi (7.0 km) offshore. Depths in the ODMDS range from 640-705 ft (195-215 m). Coordinates for the existing site are given in Table 1. The existing ODMDS is centered at 26$^{o}$ 07.00'N and 80$^{o}$ 01.50'. The ODMDS site is on the upper continental slope near the western edge of the Florida Current and consists of primarily soft-bottom habitat in water depths of 640 to 705 ft (195 to 215 m).

The Port Everglades Harbor ODMDS expansion areas are located in the Florida Straits northeast of the Port Everglades Harbor adjacent to Fort Lauderdale, in Broward County, Florida (Figure 1). The western edge of Alternative 1 is approximately 3.3 nmi (6.0 km) offshore and has an approximate area of 3.21 nmi$^2$ (11.0 km$^2$/2,721 acres). The western edge of Alternative 2 is approximately 3.2 nmi (6.1 km) offshore and has an area of 2.89 nmi$^2$ (9.9 km$^{2/}$2,449 acres). The Alternatives are on the upper continental slope near the western edge of the Florida Current in water depths of 604 to 735 ft (183 to 225 m). The expansion areas overlap one another with much of the same southern and eastern boundaries as the existing ODMDS; only the western and northern boundaries slightly differ. Coordinates for the alternatives are given in Table 1. Alternatives 1 and 2 are shown in relation to the existing ODMDS in Figure 2 and Figure 3, respectively.

There is a need to expand the existing ODMDS to accommodate the dredged material resulting from the planned Port Everglades Harbor expansion project. The need for ocean disposal is based primarily on the lack of economically, logistically, and environmentally feasible alternatives for the disposal of the projected quantities of dredged material deemed unsuitable for beach re-nourishment or beach placement (USACE, in press). The USACE is currently evaluating the proposed expansion of Port Everglades Harbor. This proposed expansion could provide an estimated 6.63 million cy under the Expansion project Feasibility Study's Tentatively Selected Plan (TSP).

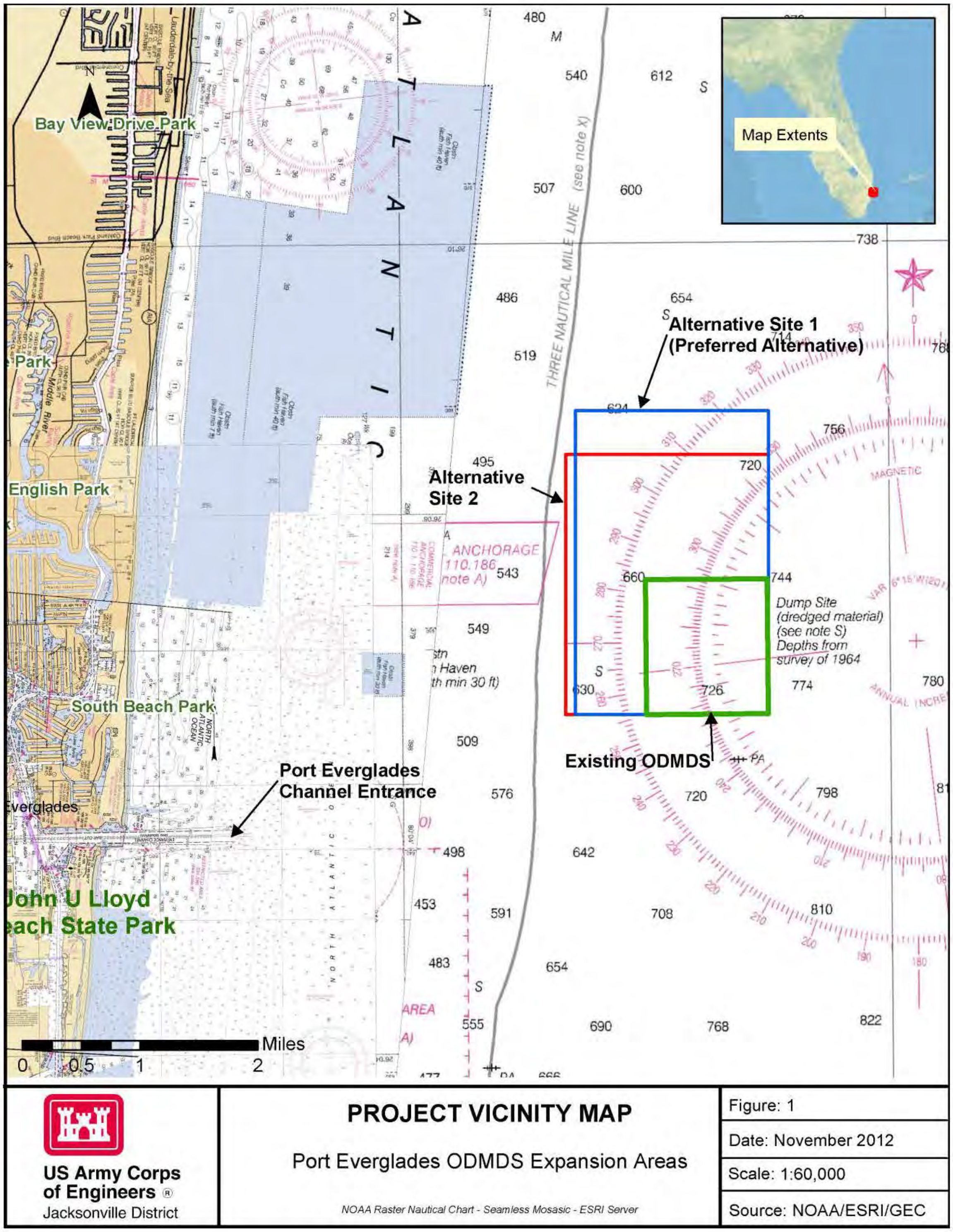



**Figure 1. Location of Port Everglades Harbor ODMDS and Proposed Expansion Areas**

**Table 1. Coordinates and total area in square nautical miles (nmi2) for the existing Port Everglades ODMDS and Proposed Alternative Sites 1 and 2.**

| Site | | Geographic (NAD83, Decimal Degrees) | | State Plane (Florida East NAD83) | | Area $nmi^2$ |
|---|---|---|---|---|---|---|
| | | Latitude | Longitude | N | E | |
| Existing ODMDS | Center | 26°07.000' | -80°01.500' | 649292.40 | 976098.20 | 0.90 |
| | SE | 26°06.500' | -80°01.000' | 646284.00 | 978856.00 | |
| | SW | 26°06.500' | -80°02.000' | 646243.00 | 973386.00 | |
| | NW | 26°07.500' | -80°02.000' | 652301.00 | 973341.00 | |
| | NE | 26°07.500' | -80°01.000' | 652342.00 | 978810.00 | |
| | | | | | | |
| Alternative Site 1 | Center | 26°07.625' | -80°01.784' | 653067.18 | 974516.67 | 3.21 |
| | SE | 26°06.493' | -80°01.000' | 646242.90 | 978855.70 | |
| | SW | 26°06.504' | -80°02.586' | 646242.90 | 970178.00 | |
| | NW | 26°08.756' | -80°02.568' | 659889.00 | 970178.00 | |
| | NE | 26°08.746' | -80°00.981' | 659889.00 | 978855.70 | |
| | | | | | | |
| Alternative Site 2 | Center | 26°07.464' | -80°01.825' | 652090.13 | 974299.72 | 2.89 |
| | SE | 26°06.493' | -80°01.000' | 646242.90 | 978855.70 | |
| | SW | 26°06.504' | -80°02.666' | 646242.90 | 969745.00 | |
| | NW | 26°08.434' | -80°02.650' | 657932.00 | 969745.00 | |
| | NE | 26°08.423' | -80°00.984' | 657932.00 | 978855.70 | |

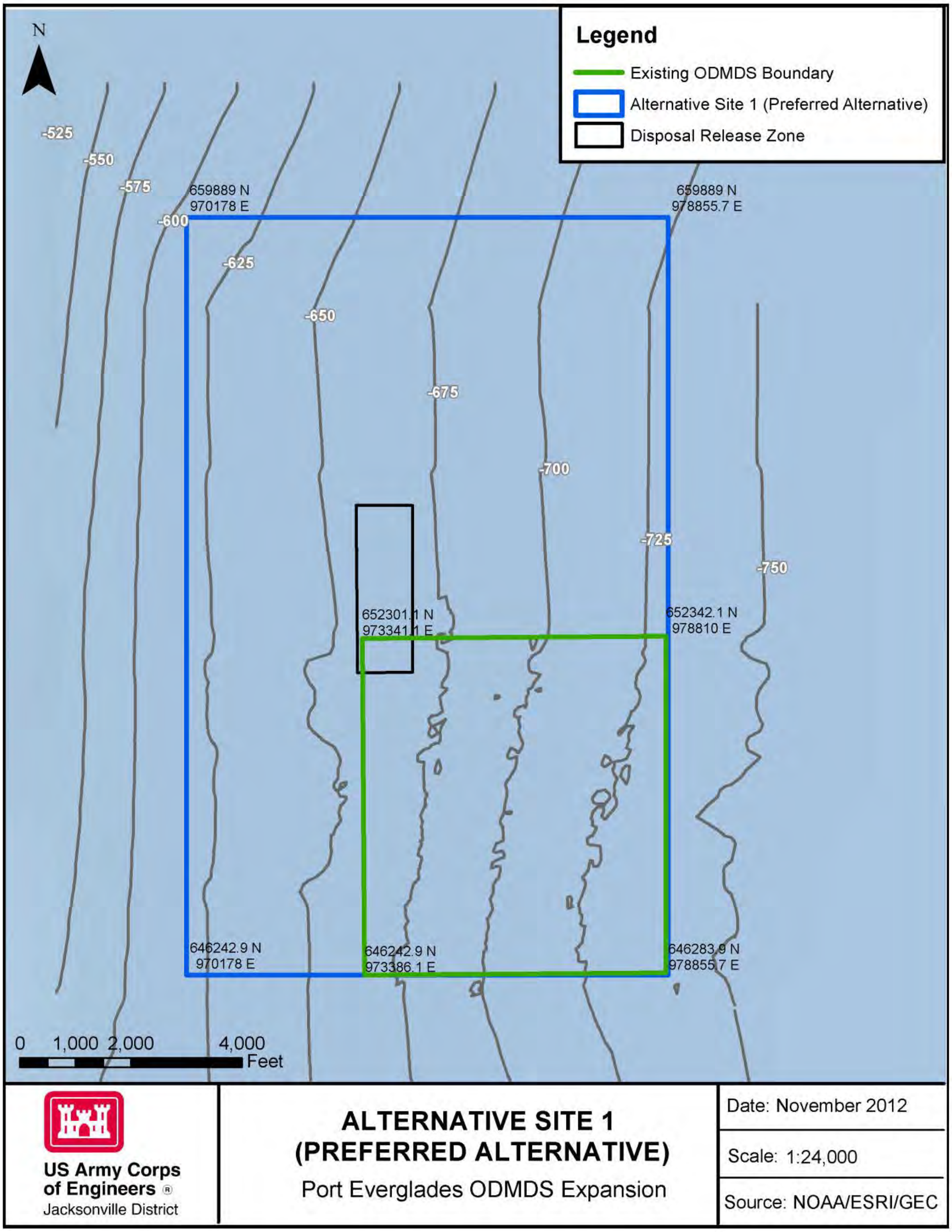



**Figure 2. Alternative 1 ODMDS Expansion Area**

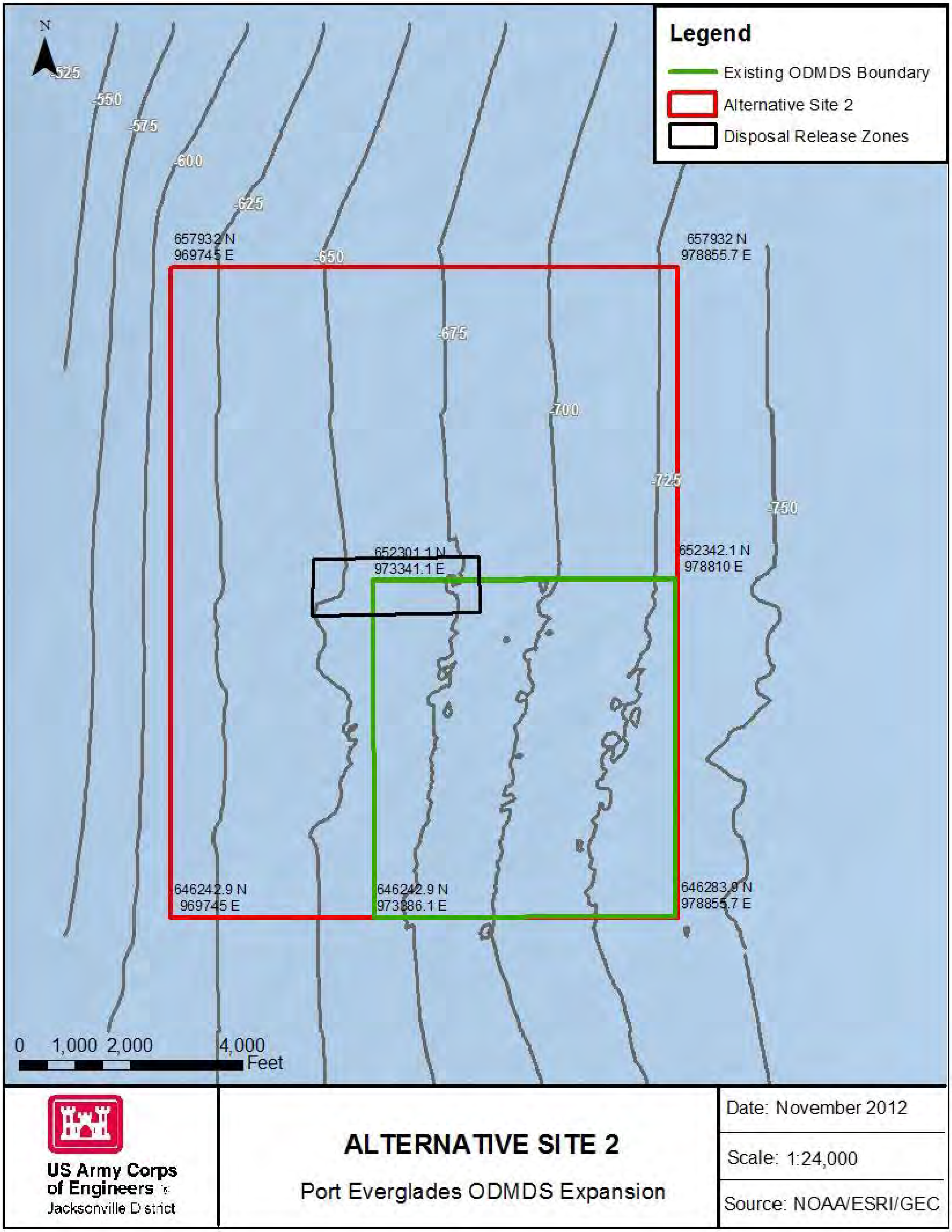
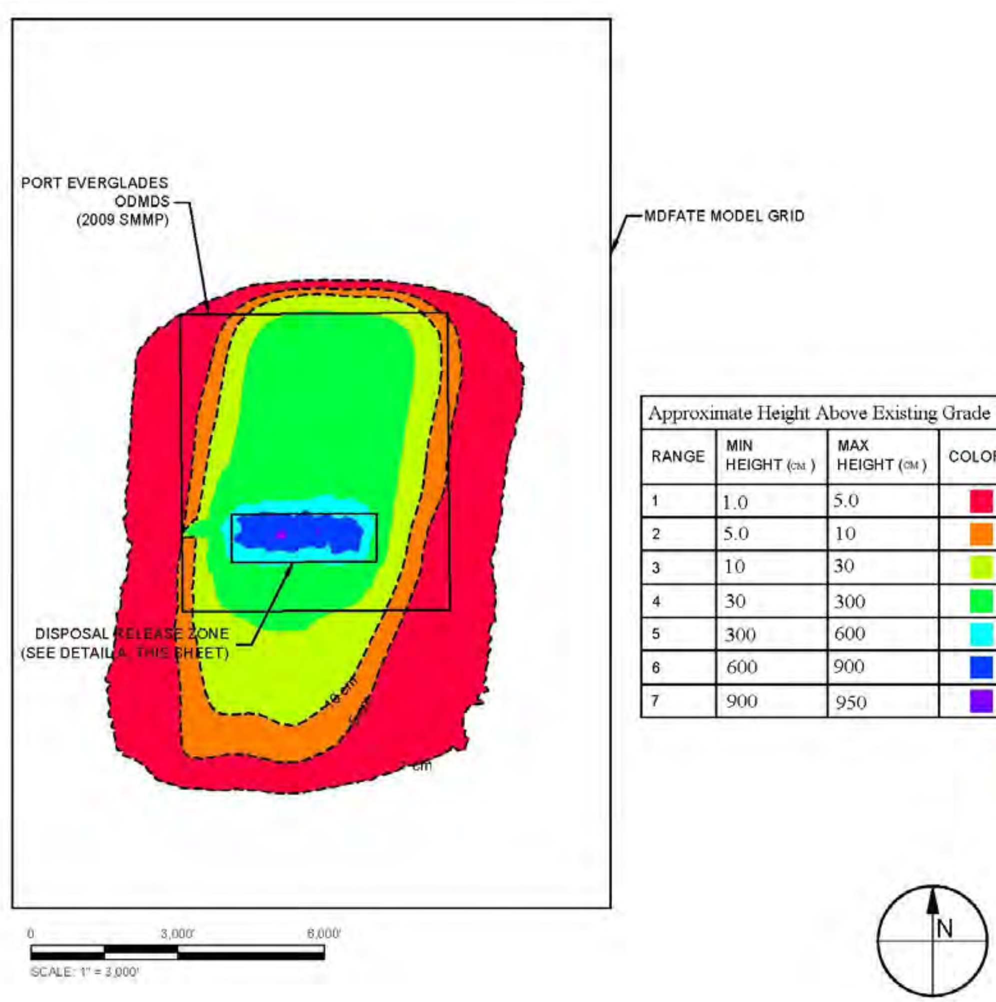



**Figure 3. Alternative 2 ODMDS Expansion Area**

The current 2009 Site Management and Monitoring Plan (SMMP) limits disposal events to 500,000 cy. If more than 500,000 cy is proposed to be disposed of in the ODMDS, additional capacity modeling is required. As previously stated, the harbor expansion project would result in up to 6.63 mcy being disposed of in the ODMDS, and since this exceeded the 500,000cy limit in the SMMP, capacity modeling for disposal of this material was completed in 2010 (Taylor Engineering 2010). Results of that study indicate that the existing, approved ODMDS is insufficient in size to contain the proposed dredged material associated with the proposed Port Everglades expansion project (Figure 4).




| Approximate Height Above Existing Grade | | | |
|---|---|---|---|
| RANGE | MIN HEIGHT (CM) | MAX HEIGHT (CM) | COLOR |
| 1 | 1.0 | 5.0 | |
| 2 | 5.0 | 10 | |
| 3 | 10 | 30 | |
| 4 | 30 | 300 | |
| 5 | 300 | 600 | |
| 6 | 600 | 900 | |
| 7 | 900 | 950 | |

**Figure 4. MDFATE and STFATE capacity modeling conducted by Taylor Engineering (Taylor 2010) shows simulated dredged material exceeding the boundaries of the Port Everglades ODMDS.**

A secondary need for expansion is for Operations and Maintenance (O&M) material and/or other non-federal projects. The original site designation was for up to 500,000 cy of O&M material. In 2005, approximately 60,000 cy of dredged material was placed in the existing ODMDS via a release zone in the middle of the site. Annual average shoaling rates of 30,000 cubic yards (cy) at Port Everglades Harbor have been projected (EPA 1994; Olsen & Associates 2003); however rates of shoaling in the entrance channel may be increasing (USACE 2005). A 2006 post-disposal monitoring survey showed dredged material was observed to have exceeded the existing site's northern boundary, forming an uneven ellipse elongated in a north-south direction (Germano & Associates, Inc. 2006). Figure 5 shows extent and thickness of dredged material within and exceeding the Port Everglades ODMDS to the north of the site. Based on the results of this survey, the disposal release zone was moved to the southern end of the site to accommodate for the strong northern Florida Current/Gulf Stream current. USACE conducted an O&M dredging event in early 2013 of approximately five times more dredged material than in 2005. EPA is planning a post disposal monitoring event in 2014. The monitoring will determine if movement of the disposal release zone was sufficient to contain all material within the existing boundaries or if a site expansion is needed. Broward County has also proposed using the ODMDS for disposal material from the Port Everglades Sand Bypass Project (SAJ-2008-2034). Project volumes could exceed 500,000 cubic yards requiring capacity modeling and possible site expansion. If the revised disposal release zone is not sufficient to contain the dredged material within the ODMDS boundaries or if future projects are expected to exceed the capacity of the ODMDS, a need will exist to expand the site.

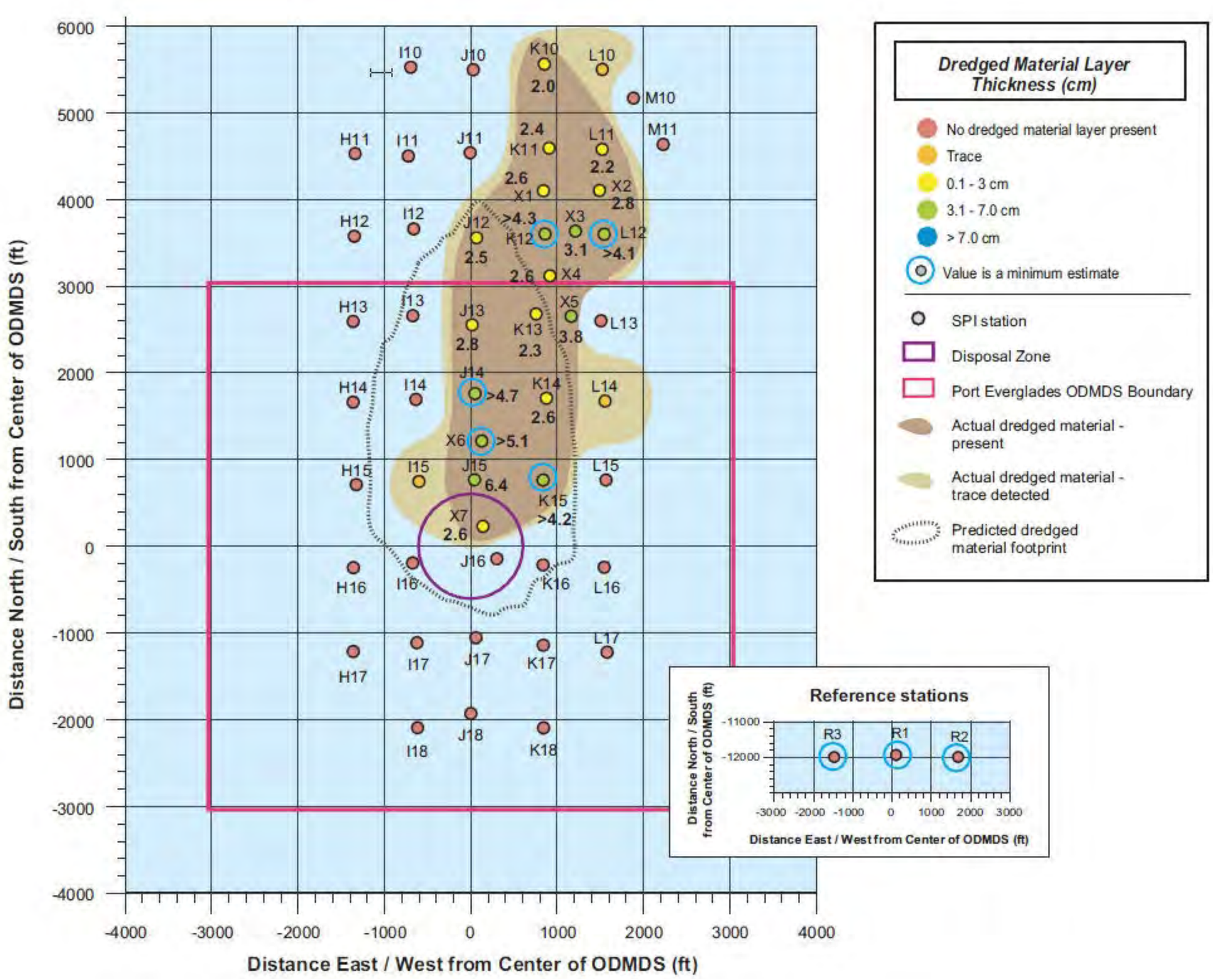


**Figure 5. Distribution of dredged material after maintenance disposal event based on analysis of sediment profile images as compared with modeled results for the Port Everglades ODMDS (Germano & Associates, Inc. 2006).**

### 1.2 DREDGED MATERIAL

As noted above, site designation does not authorize use or disposal of dredged material in the ODMDS. Each project will require evaluation for suitability for utilization of the ODMDS. This will include an analysis for the need for ocean disposal, compliance with the Ocean Dumping Criteria and compliance with the current approved SMMP. An SMMP was prepared in 2004 and updated in May 2009 and will be revised for the expanded site, when designated. A draft of the revised SMMP was included in the Draft EA as Appendix E.

### 1.3 TRANSPORT AND DISPOSAL METHODS

There are no restrictions on the types of vessels to be used for disposal of dredged material at the Port Everglades Harbor ODMDS. Ocean disposal of dredged material typically utilizes either a self propelled hopper dredge or a disposal barge towed by a tug. Hydraulic dredges such as the hopper dredge typically result in a disposed material with higher water content (e.g., 80 percent water, 20 percent solids) as a result of slurrying the sediments with water (Herbich 1992). The SMMP provides requirements for disposal operations, including a disposal zone and disposal monitoring requirements.

## 2 FISH HABITAT OVERVIEW

The Magnuson-Stevens Fishery Conservation and Management Act, as amended, PL 104-208, addresses the authorized responsibilities for the protection of EFH by the National Marine Fisheries Service (NMFS) in association with regional Fishery Management Councils (FMC). EFH applies to habitat specific to an individual species or group of species, whichever is appropriate within each Fishery Management Plan (FMP). Habitat Areas of Particular Concern (HAPCs) are subsets of EFH that have been designated by a FMC or by the NMFS Highly Migratory Species Division for their ecological importance to Federally managed species, vulnerability to degradation, or rarity of habitat (NMFS 2006a). HAPCs generally include high value intertidal and estuarine habitats, offshore areas of high habitat value or vertical relief, and habitats used for migration, spawning, and rearing of fish.

### 2.1 MANAGED SPECIES

The Port Everglades Harbor ODMDS expansion areas fall under the jurisdiction of the South Atlantic Fishery Management Council (SAFMC). The SAFMC has identified and described EFH for hundreds of marine species covered by eight Fishery Management Plans (FMPs). In addition, the NMFS has prepared a FMP for Highly Migratory Species (tunas, billfishes, sharks, and swordfish) which includes associated EFH. With the exception of the golden crab which was added to the list of Federally managed species after the original site designation, the list of species managed by the SAFMC and South Atlantic species managed under Federally-Implemented Fishery Management Plans that could potentially be affected by the project is provided in Table 1 of the EFH Assessment prepared for the original site designation and is incorporated by reference, since there is no difference in managed species between the existing site and either of the proposed sites.

Deepwater hard and soft bottom habitats within, and in close proximity to the ODMDS expansion area are designated EFH for species managed under the Snapper-Grouper, Golden Crab, Spiny Lobster and Shrimp Fisheries (NMFS, 2011). In addition, species from the Highly Migratory Pelagic Fisheries may be present in the area.

## 2.2 ESSENTIAL FISH HABITAT AND HABITAT AREAS OF CONCERN IN THE VICINITY OF THE PORT EVERGLADES HARBOR ODMDS EXPANSION AREAS

The habitat categories of EFH for managed species which could potentially be found in the ODMDS expansion areas are: artificial/manmade reefs; coral and coral reefs, live/hard bottoms, *Sargassum*; and water column. The HAPCs for managed species which may be found in the ODMDS expansion areas include: Hermatypic (reef-forming) coral habitat and reefs, hard bottom, and *Sargassum* habitat.

Areas which meet the criteria for essential fish habitat-habitat areas of particular concern (EFH-HAPCs) for coral, coral reefs, and live/hard bottom in east Florida include the *Phragmatopoma* (worm reefs) reefs off the central east coast of Florida; Oculina Banks off the east coast of Florida from Ft. Pierce to Cape Canaveral; nearshore (0-4 meters; 0-12 feet) hard bottom off the east coast of Florida from Cape Canaveral to Broward County); offshore (5-30 meter; 15-90 feet) hard bottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida; Biscayne National Park, Florida; and the Florida Keys National Marine Sanctuary (SAFMC 1998). HAPCs in the vicinity of the ODMDS expansion areas are shown in Figure 6.

The Stetson Reefs, Savannah and East Florida Lithoherms, and Miami Terrace (Stetson-Miami Terrace) CHAPC is the largest deepwater coral HAPC off the coast of east Florida; this CHAPC follows the 1,312 ft (400m) depth contour and covers a large area north to south (22,876 square miles) extends to the 1,312 ft (400 m) depth contour (SAFMC and NMFS 2009). The Miami Terrace is a 40-mile-long carbonate platform between Boca Raton and South Miami in depths of 656 to 1,312 ft (200 to 400 m) (Reed *et al.* 2006). The Miami Terrace provides high-relief rocky habitat for rich communities of benthic invertebrates and fishes, as well as various species of coral. This CHAPC is located approximately 0.5 nmi east of the southeastern corner of the proposed ODMDS expansion area.

The Florida Current and associated eddies provide valuable fish habitat. Species and life-stage-specific patterns vary between the inshore and offshore Florida Current/Gulf Stream fronts. Dolphin and swordfish often utilize offshore fronts (SAFMC 2002). Most swordfish were reported along the oceanic front between nearshore waters and the Florida Current, which may meander as close as 4.3 nmi (8 km) offshore.

Table 2 of the EFH Assessment prepared for the original designation details Geographically Defined HAPCs and is incorporated herein by reference.

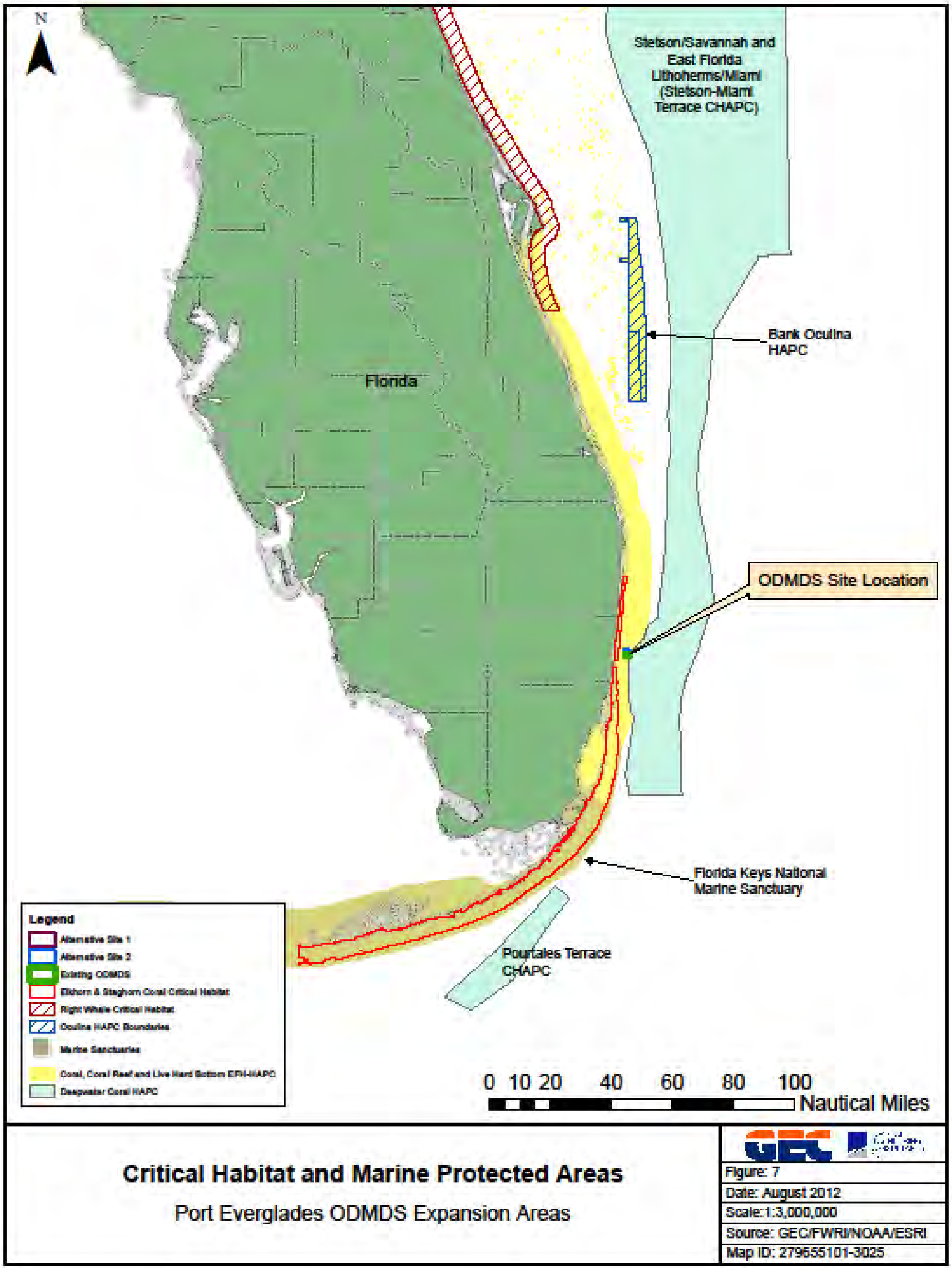



**Figure 6. Habitat Areas of Particular Concern and Marine Protected Areas near the ODMDS Expansion Areas**

## 2.3 FISHERY RESOURCES IN THE VICINITY OF THE PORT EVERGLADES HARBOR ODMDS EXPANSION AREAS

Finfish species that could potentially occur in the proposed ODMDS expansion areas can be categorized as reef, demersal, coastal pelagic, oceanic pelagic or mesopelagic species, depending on habitat utilization.

In April 2006, a benthic video survey was conducted in a 31.55 mile long corridor east of the ODMDS expansion areas for the Calypso LNG Deepwater Port project area to evaluate the habitat present (Messing et al. 2006). Although the purpose of this study was not to identify local fish species, at least 17 species were observed during the course of the survey (Table 2).

**Table 2. Fish Species Identified during Calypso Pipeline Survey**

| Common Name | Species or Taxa | Common Name | Species |
|---|---|---|---|
| Blind torpedo | *Benthobatis marcida* | Gulf Stream flounder | *Citharichthys arctifrons* |
| Shortnose greeneye | *Chlorophthalmus agassizi* | Greatnorthern tilefish | *Lopholatilus chamaeleonticeps* |
| Armored searobin | *Peristedion sp.* | Spiny eel | *Notcanthidae* |
| Blueline tilefish | *Caulolatius microps* | Tripod fish | *Bathypterois sp.* |
| Frogmouth (gaper) | *Chaunax pictus* | Rattail | *Nezumai sp.* |
| Blackbelly rosefish | *Helicolenus dactylopterus* | Blacktail codling | *Laemonema melanurum* |
| Unknown skate | *Rajidae* | Catshark | *Scyliorhinidae* |
| Unidentified eels | *Synaphobranchidae* | Rattail | *Coelorhynchus sp.* |
| Unidentified scorpionfishes | *Scorpaenidae* | | |

A total of 15 families (representing 10 orders) were collected in the trawl samples in the ODMDS expansion areas during the site designation study (Table 3; Figure 7; ANAMAR 2012). Four species of Perciformes represented 22 percent of all fish species collected; however, the bar jack and the rainbow runner, are pelagic species. The most abundant fish species caught in trawls in the ODMDS expansion areas during the site designation study was the Gulf Stream flounder (*Citharicthys arctifrons*). Other abundant species included the highfin scorpionfish (*Pontinus rathbuni*) and the fawn cusk-eel (*Lepophidum profundorum*) (ANAMAR 2012). The spotted hake may forage for benthic invertebrates and fishes in the area. The blind torpedoes and rosette skates captured during the trawl survey likely use the area for foraging. Many of the invertebrates and the fishes are potential prey for deepwater apex predators such as the sharpnose sevengill shark (*Heptranchias perlo*) and bluntnose sixgill shark *(Hexanchus griseus)* (ANAMAR 2012).

**Table 3. Fish Species Observed during Trawling in ODMDS Expansion Areas and Benthic Survey in Nearby Waters – Anamar, 2012 (Table 17)**

| Common Name | Species or Taxa | Common Name | Species |
|---|---|---|---|
| Rosette skate | *Leucoraja garmani* | Fourspot flounder | *Paralichthys oblongus* |
| Blind torpedo | *Benthobatis marcida* | Deepwater flounder | *Monolene sessilicauda* |
| Argentine | *Argentina georgei* | Highfin scorpionfish | *Pontinus rathbuni* |
| Shortnose greeneye | *Chlorophthalmus agassizi* | Rimspine searobin | *Peristedion thompsoni* |
| Shortbeard codling | *Laemonema barbatulum* | Blackmouth bass | *Synagrops bellus* |
| Metallic codling | *Physiculus fulvus* | Bar jack | *Caranx ruber* |
| Spotted hake | *Urophycis regia* | Rainbow runner | *Elagatis bipinnulata* |
| Fawn cusk-eel | *Lepophidium profundorum* | Spotfin dragonet | *Foetorepus agassizii* |
| Blackfin goosefish | *Lophius gastrophysus* | Gulf Stream flounder | *Citharichthys arctifrons* |

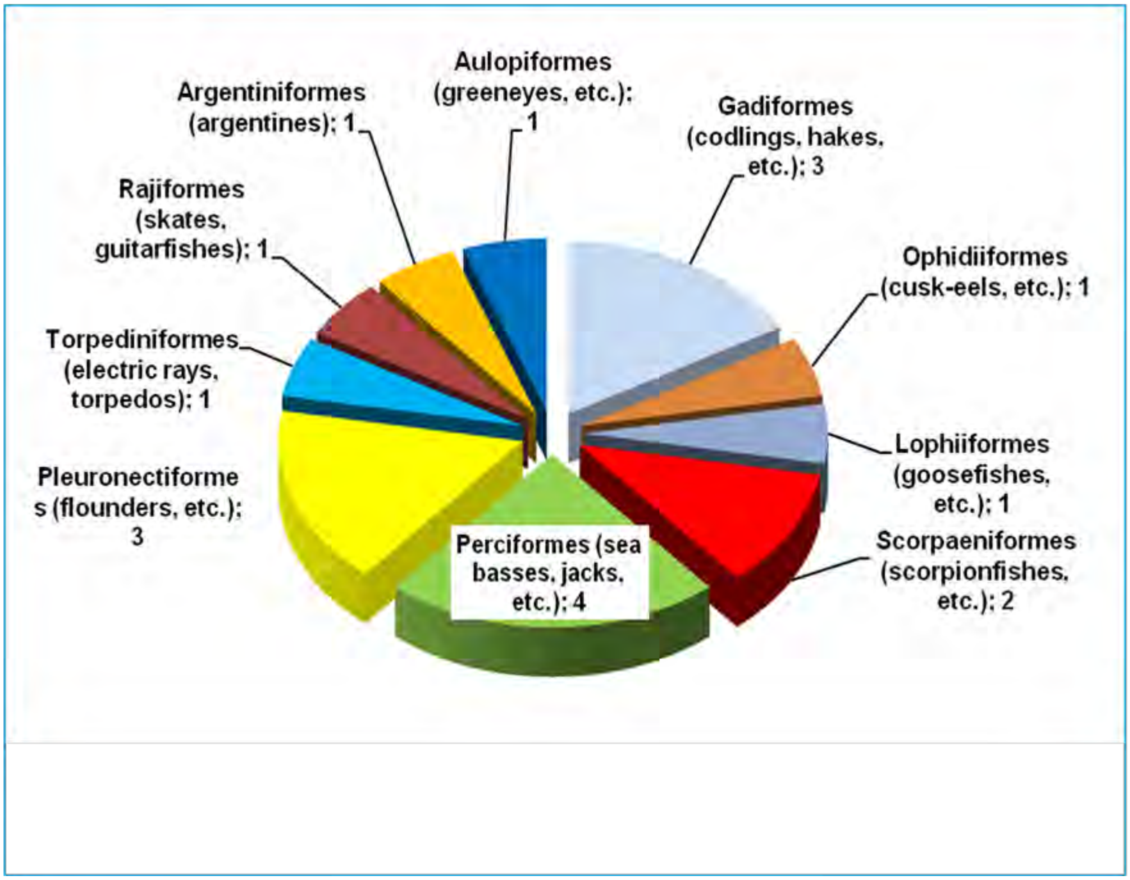



**Figure 7. Eighteen trawled fish species, by order, collected in epifaunal trawl samples (source ANAMAR 2012)**

## 2.4 EPIFAUNA

Epifaunal taxa collected in trawls during the site designation study were primarily fishes and arthropods (Figure 8; ANAMAR 2012). The highest total epifaunal density (87.79 individuals per 1,000 $m^3$) was observed west of the ODMDS expansion areas during the site designation study (Table 4).

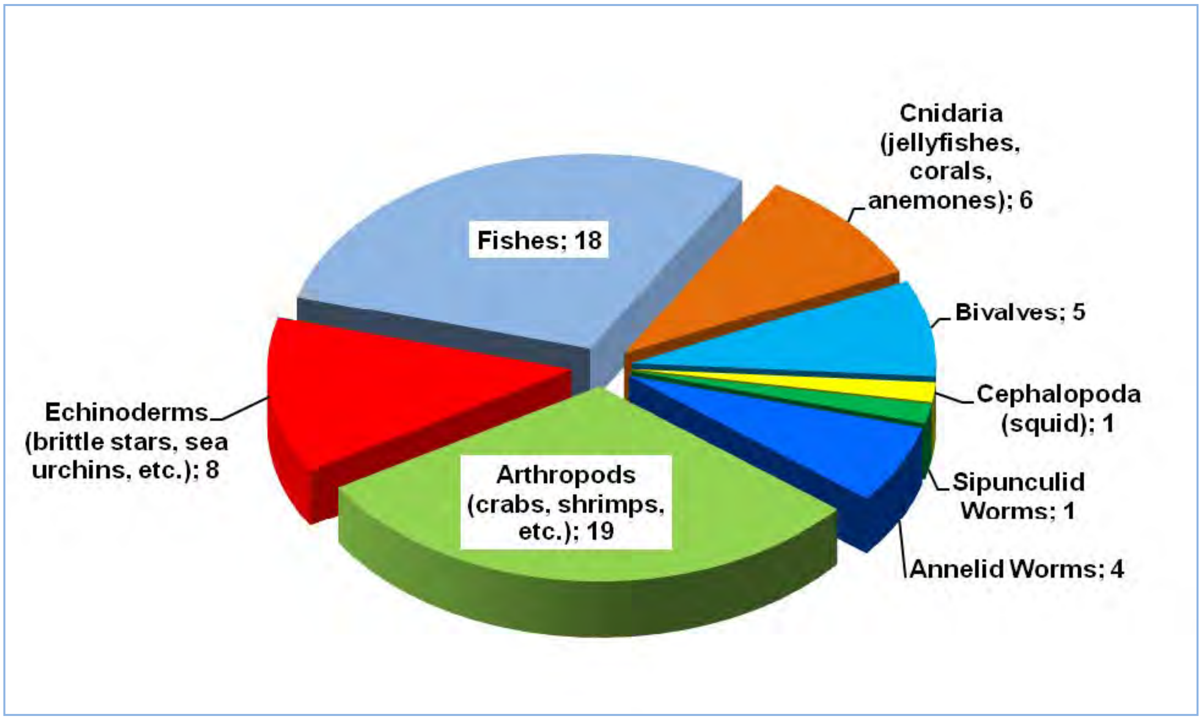



**Figure 8. 62 trawled epifaunal taxa by major taxonomic group (includes all epifaunal trawl samples) (source ANAMAR 2012).**

**Table 4. Total Epifaunal Density per Station, by Rank**

| **Total Epifaunal Density per Station, by Rank** | | |
|---|---|---|
| **Station Number** | **Relationship to Expansion Areas** | **Total Epifaunal Density (individuals/1,000 $m^3$)** |
| PE11-9 | Outside (west of) Expansion Areas | 87.79 |
| PE11-6 | Inside Expansion Areas | 57.86 |
| PE11-8 | Outside (south of) Expansion Areas | 31.27 |
| PE11-7 | Inside Expansion Areas | 30.47 |

**(Source ANAMAR 2012)**

## 2.5 EFH DESCRIPTIONS

EFH of the following managed fisheries and habitats warrant further discussion: Shrimp; Snapper-Grouper Complex; Golden Crab; Coral and Coral Reefs and Live/Hardbottom; Highly Migratory Species; Artificial Reefs; *Sargassum*; Water Column, and Spiny Lobster.

### *2.5.1 SHRIMP FMP*

A description of Royal red shrimp EFH was included in Section 2.3.2 of the 2004 ODMDS designation EFH Assessment and is incorporated by reference. The depths of the Port Everglades ODMDS expansion areas are near the shallower limits of the red royal shrimp designated EFH.

A description of Penaied shrimp (larvae) EFH was included in Section 2.3.1 of the 2004 ODMDS designation EFH Assessment and is incorporated by reference.

### *2.5.2 SNAPPER-GROUPER FMP*

A description of Snapper-Grouper Complex EFH was included in Section 2.3.4 of the 2004 ODMDS designation EFH Assessment and is incorporated by reference. There may be a limited area of EFH-HAPCs for snapper-grouper in the ODMDS expansion areas, such as in the rubble areas.

Tilefish, a member of the snapper-grouper complex, are not strictly a reef species and occur in the vicinity of the ODMDS where the substrate is muddy or clayey. Tilefish were documented within the upper corner of the proposed ODMDS expansion areas during a remotely operated vehicle (ROV) survey (NMFS 2011). While tilefish were observed during the Calypso Pipeline habitat study (Messing et al 2006) that covered a large swath of habitats, they were not observed or collected during the habitat characterization study conducted specific to the ODMDS expansion areas.

### *2.5.3 HIGHLY MIGRATORY SPECIES FMP*

A description of Highly Migratory Species EFH was included in Section 2.3.5 of the 2004 ODMDS designation EFH Assessment and is incorporated by reference. EFH for highly migratory species with EFH in the ODMDS expansion areas are presented in Table 1 of the 2004 EFH Assessment.

### *2.5.4 GOLDEN CRAB FMP*

The golden crab inhabits the continental slope of Bermuda (Luckhurst 1986; Manning and Holthuis 1986) and the southeastern United States from waters offshore of Chesapeake Bay (Schroeder 1959), south through the Straits of Florida and into the eastern Gulf of Mexico (Manning and Holthuis 1984, 1986; Otwell *et al.* 1984; Wenner *et al.* 1987; Erdman 1990). Golden crabs have been reported in waters 205 m deep off the Dry Tortugas (Manning and Holthuis 1984) to 1,007 m deep off Bermuda (Manning and Holthuis 1986). Female golden crabs generally release larvae offshore in depths shallower than 500 m (Wenner *et al.* 1987). Golden crabs were observed by Reed and Farrington (2010) in depths from 247 to 888 m with a peak in numbers between 300 and 500; densities were twice as great on soft muddy-sand substrate compared to hard bottom, either coral or rock (NMFS 2007).

EFH for the golden crab includes the U.S. Continental Shelf from Chesapeake Bay south through the Florida Straits, and into the Gulf of Mexico. The Florida Current/Gulf Stream is also EFH and provides a mechanism to disperse crab larvae. Golden Crabs are found in seven distinct EFH habitats: a flat foraminferan ooze habitat; distinct mounds, primarily of dead coral; ripple habitat; dunes; black pebble habitat; low outcrop; and soft-bioturbated habitat (Wenner *et. al* 1987). Golden crabs appear to be most abundant between 367 and 549 meters in the South Atlantic Bight. Abundance appears to be influenced by sediment type; highest catches occur on substrates containing a mixture of silt-clay and foraminiferan shell. Offshore, unconsolidated bottom, including ripple habitat, dunes, soft bioturbated habitat, and low relief outcrops are EFH for golden crab (NMFS 2011).

### *2.5.5 CORAL, CORAL REEFS AND LIVE/HARDBOTTOM HABITAT FMP*

A description of Coral, Coral Reefs and Live/Hardbottom EFH was included in Section 2.3.7 of the 2004 ODMDS designation EFH Assessment and is incorporated by reference.

The original ODMDS was sited to avoid hard bottom (EPA 2004). Previous studies have suggested that hardbottom may be present in portions of the ODMDS expansion area. A survey was conducted for the now-defunct Tractebel Calypso Pipeline Project in 2004 of the region to the west of the proposed ODMDS expansion area Figure 9. The overlap of the ODMDS expansion area and the Calypso Pipeline survey area (USCG 2008) was primarily soft bottom; however, a small area of hardbottom was reported. Along this area, Nova Southeastern University (NSU) scientists observed 1 to 2 foot diameter boulders, anemones, sponges, hydroids, and mud bottom with signs of bioturbation (NMFS 2011).

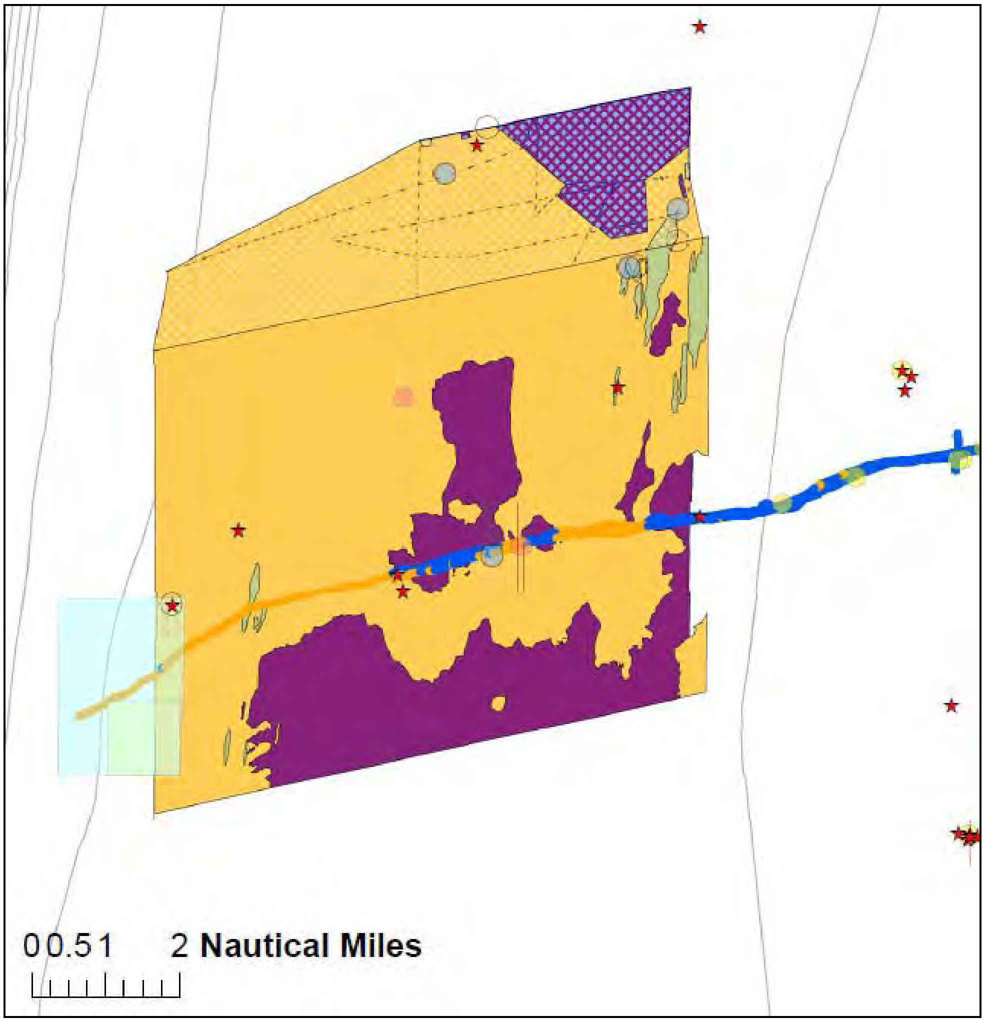



**Figure 9. Hardbottom Adjacent to ODMDS Expansion Areas; Light blue = existing ODMDS and proposed expansion area; tan polygons and lines = soft bottom; dark blue = rock or hardbottom; red = high profile coral habitat; red stars = tilefish; red star in the upper right corner of the ODMDS expansion area is a possible shipwreck. Figure provided by Mr. John Reed (HBOI/FAU) (NMFS, 2011).**

The Navy conducted a multi-beam bathymetry survey in 2001 within the proposed expansion area which indicated some areas with low relief that gave the appearance of hardbottom. However, none of these areas were confirmed (B.K. Walker, National Coral Reef Institute, letter dated April 18, 2011). NSU scientists evaluated identified several with potential high or medium relief areas with probability of supporting hardbottom features inside the expansion area (Figure 10; NMFS 2011). The scale of this survey was accurate to approximately 10 meters (Brian Walker, NCRI, pers comm. Nov 2012), meaning that the features utilized to classify the areas of potential hardbottom were approximately 33 feet apart.

Based on the areas identified by NSU and presented by NMFS, USACE calculated that if all of the areas defined as potential hardbottom were in fact hardbottom, a total of 243 acres of bottom would be classified as hardbottom. Areas identified as potential hardbottom by NSU contained within the existing ODMDS boundaries were excluded from analysis because a disposal event had taken place since the collection of the multi-beam surveys, resulting in a change to the bottom characterization by dredged material. Additionally, continued use of the existing ODMDS is planned for the foreseeable future.

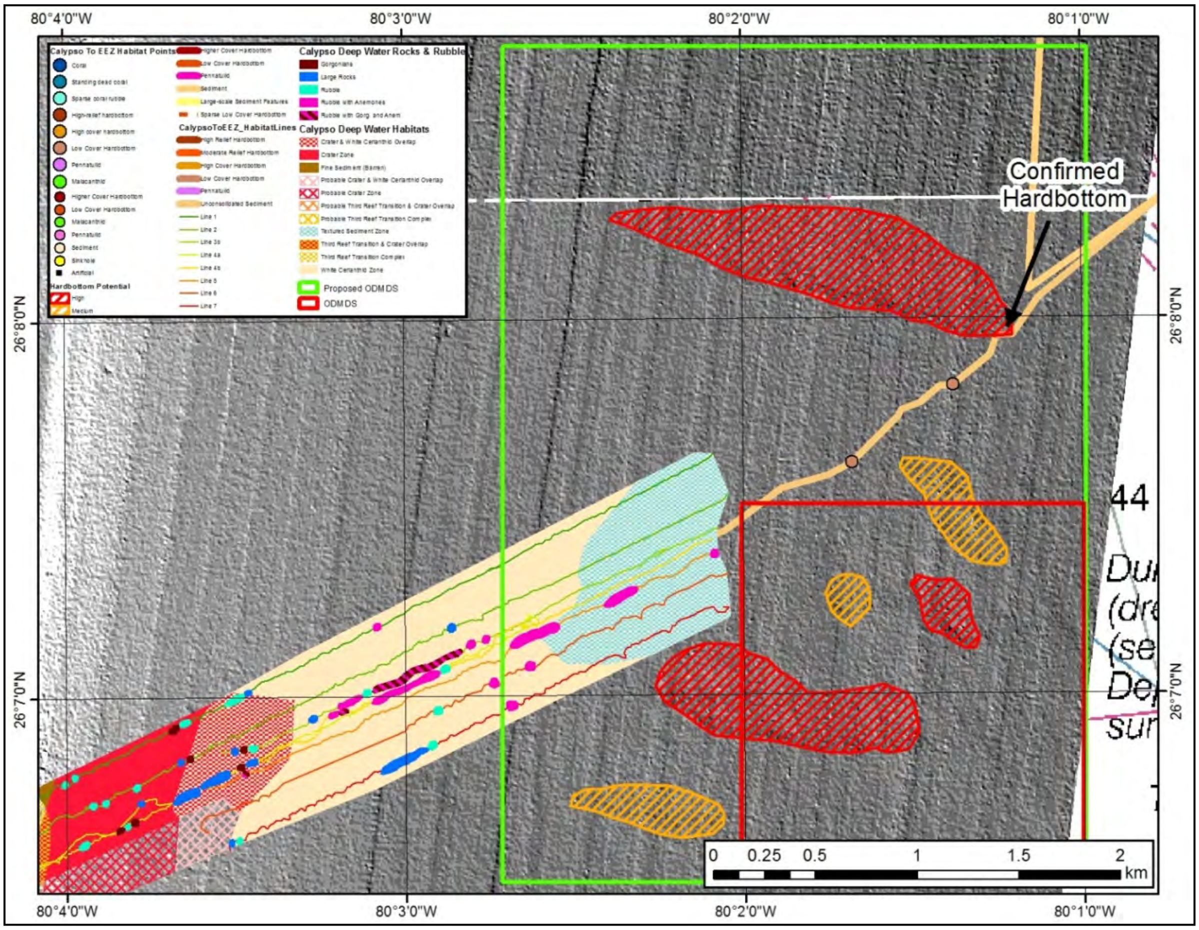



**Figure 10. Areas of Suspected Hardbottom in the ODMDS Expansion Areas as identified by NSU (NMFS 2011)**

Variable relief in bathymetry and incidences of hardbottom occurrences along ROV transects indicate a total of six areas of potential hardbottom near with the existing ODMDS and proposed expansion area.

The areas of suspected hardbottom identified by NSU in the ODMDS expansion areas were sampled during the site designation study by the USEPA's Ocean Survey Vessel (OSV), Bold, in May 2011 (ANAMAR 2012). The OSV Bold conducted a survey of the site that included taking sediment profile and plan view images of the seafloor at 49 stations, with specific focus on the areas identified as having a high or medium potential for being hardbottom based on the NSU analysis (Figure 11).

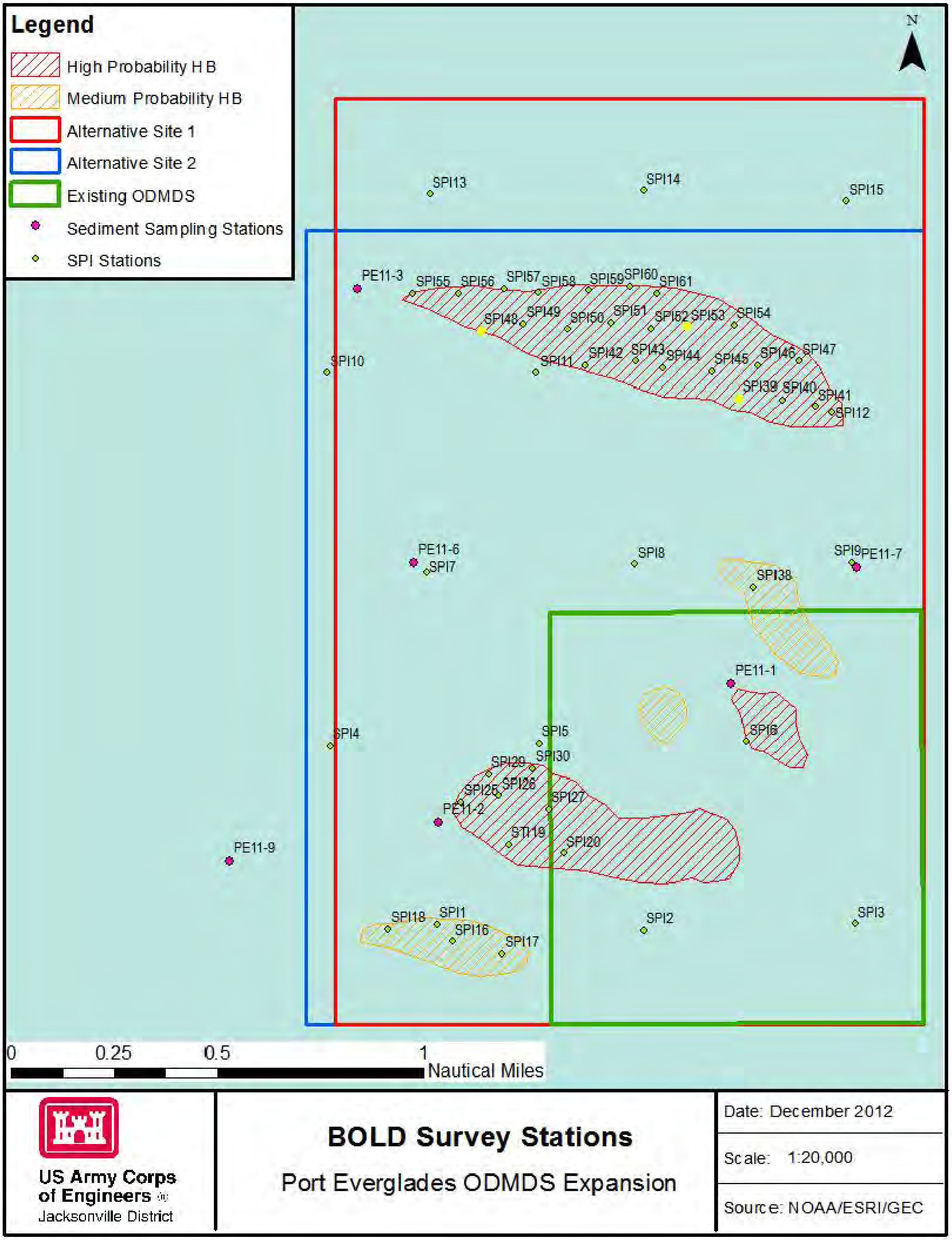



**Figure 11. Areas of Suspected Hardbottom in the ODMDS Expansion Areas**

A total of 85 photographs from the 33 stations within the areas identified as potentially containing hardbottom by NSU. Each photograph covered an area approximately 300 cm long by 200 cm wide for a total coverage of 60,000 $cm^2$. Areas of limited hardbottom were observed, primarily in the northernmost suspected hardbottom area. Relief was only noted at three of the stations (SPI-48, SPI-53, and SPI-39) indicated in bold yellow in Figure 11. At each of these stations, the relief was only observed in one of the three replicate photographs, indicating that the area of relief was spatially limited (Figure 12). The photos with relief comprised 1% of the bottom sampled over the areas classified as either high or medium potential for the presence of hardbottom. No corals were observed in the photographs.

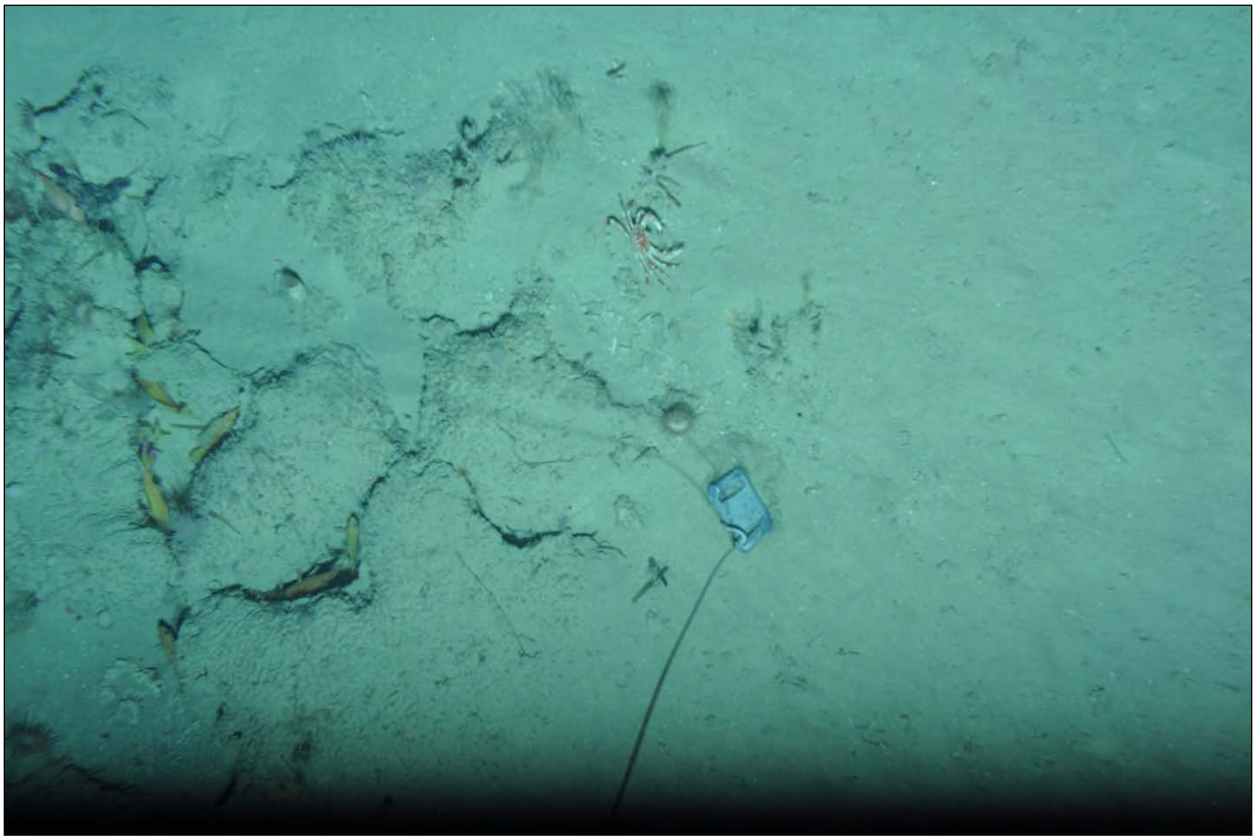


**Figure 12. Typical hardbottom observed during OSV Bold survey**

The limited rock bottom located during the survey was concentrated primarily in the northernmost suspected hardbottom area. Although small areas of hardbottom were observed, nothing was observed to warrant discontinuation of the site expansion process. In addition, epifaunal trawl samples were taken inside and outside the ODMDS expansion areas. One trawl sample in the ODMDS expansion area included cobble-sized carbonate rocks and several pieces of rose coral (*Manicina* sp.) that had apparently been dead for a long period. No live hard corals (Scleractina) were found in any trawl samples (ANAMAR 2012).

In an effort to review all potential data sources to identify hardbottoms, USACE reviewed the side-scan sonar tracts reviewed for the cultural resource assessment to determine if any features were denotable on the bottom. To be as conservative as possible, USACE and EPA classified all non-manmade targets detected in the survey as "hardbottom" (Figure 13, Figure 14). The size of each target was calculated and the total area of potential hardbottom tabulated for both alternatives. Based on this analysis, Alternatives 1 and 2 each contain 12.85 acres of potential hardbottom within the total footprint of the expansion areas.


**Figure 13. Potential Hardbottom Targets in Alternative 1**

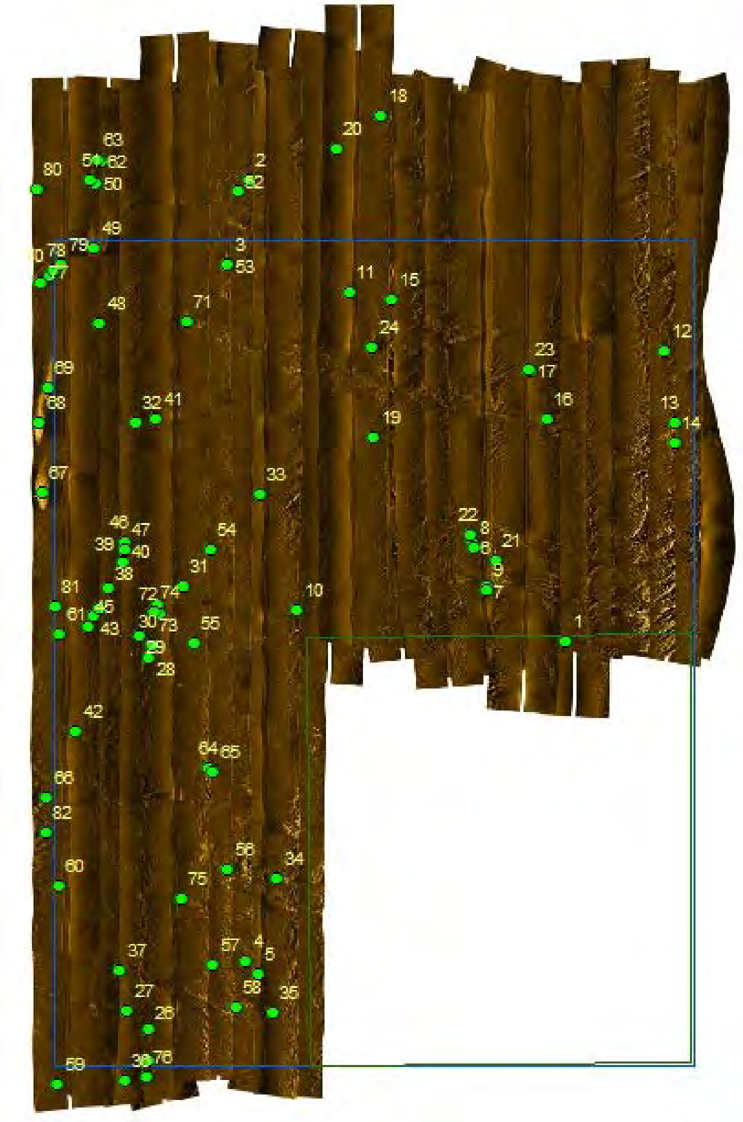



**Figure 14. Potential Hardbottom Targets in Alternative 2**

Sediment collected from five stations (including inside the existing ODMDS and inside and outside the expansion areas) was analyzed (ANAMAR 2012). Samples contained primarily sand (55.7 to 64.9 percent, by weight); 49 to 54.3 percent of this was fine sand (Table 5). Silt and clay were also a major component of samples, representing 35.1 to 44.3 percent.

**Table 5. Summary of Sediment Grain Size Analysis in Relation to the Expansion Areas**

| Location of Pooled Samples[1] | Percent Gravel[2] (Range) | Percent Sand [2] (Range) | Percent Silt and Clay[2] (Range) | USCS[3] Classification(s) |
|---|---|---|---|---|
| Inside ODMDS | 0.0 | 64.3 | 35.7 | Clayey to silty sand |
| Inside Expansion Areas | 0.0–0.0 | 55.7–64.9 | 35.1–44.3 | Clayey to silty sand |
| Outside Expansion Areas | 0.0–0.0 | 58.3–63.6 | 36.4–41.7 | Clayey to silty sand |

[1]Results of the ODMDS sample (Station PE11-1) were averaged with the field split sample.
[2]Particle sizes: gravel ≥4.750 mm, sand = 0.075–4.749 mm, silt and clay <0.075 mm
[3]USCS=Unified Soil Classification System.
(Source ANAMAR 2012)

Areas which meet the criteria for essential fish habitat-habitat areas of particular concern (EFH-HAPCs) for coral, coral reefs, and live/hard bottom in the vicinity of the proposed expansion sites include the Stetson Reefs, Savannah and East Florida Lithoherms, and Miami Terrace (Stetson-Miami Terrace) HAPC, located approximately 0.5 nmi east of the southeastern corner of the proposed existing ODMDS and subsequently the expansion areas, since they share the common boundary.

### *2.5.6 ARTIFICIAL REEFS*

A description of Artificial Reef EFH was included in Section 2.3.8 of the 2004 ODMDS designation EFH Assessment and is incorporated by reference. The EIS included a table of 35 artificial reef sites within 5 nmi of the original ODMDS site. Since then, Broward County may have authorized additional sites. A GIS layer of all of the authorized and permitted artificial reef sites document 59 sites within 5 nmi of the proposed expansion sites (Broward County 2012). A copy of this shapefile is available upon request. One cluster of 17 structures is approximately 2.25 nmi (14.2 km) northwest of the proposed ODMDS expansion areas. Another cluster of three structures is 2 nmi (3.7 km) west of the southwestern edge of the ODMDS. In addition, a modern ship wreck was reported in the northeast corner of the ODMDS expansion areas. . This shipwreck was also confirmed during the Cultural Resources sidescan sonar survey.

### *2.5.7 SARGASSUM*

A description of Sargassum EFH was included in Section 2.3.9 of the 2004 ODMDS designation EFH Assessment and is incorporated by reference.

### *2.5.8 WATER COLUMN*

A description of Water Column EFH was included in Section 2.3.10 of the 2004 ODMDS designation EFH Assessment and is incorporated by reference.

### *2.5.9 SPINY LOBSTER*

A description of Spiny Lobster EFH was included in Section 2.3.6 of the 2004 ODMDS designation EFH Assessment and is incorporated by reference.

# 3 EFH IMPACTS

Expanding the Port Everglades Harbor ODMDS may have minor and temporary adverse affects on EFH. Direct and indirect impacts to the water column and benthos will be mitigated through appropriate testing of the dredged material prior to disposal. The greatest potential for impact would likely occur as a result of accumulation of dredged material and associated changes in sediment characteristics that may cause impacts to benthic-dwelling organisms and the burial of rubble zones within the proposed ODMDS expansion area boundaries. However, the benthic community in the area of the proposed ODMDS expansion is adapted to frequent physical disturbance due to high current velocities in the general area.

Burial of the rubble areas could affect the habitat of the Snapper-Grouper Complex (yellowedge grouper, Warsaw grouper, blackfin snapper, golden tilefish, blueline tilefish), golden crab and hard/live bottom. Burial of soft-bottom habitat and low-relief habitat in some portions of the ODMDS expansion areas by dredged material could affect the golden crab. The EPA and the USACE propose to monitor the areal extent of impact and the rate of recovery. The introduction of contaminants and toxic substances into waters and substrates, increased and harmful turbidity levels and creation of hazards to fishing and navigation are also effects of ocean dumping. The greatest potential impacts due to cumulative impacts are associated with major navigation projects that would utilize the expanded ODMDS. The effect of any future project would be dependent on the volume of material to be disposed at the ODMDS.

## 3.1 OVERVIEW OF DREDGED MATERIAL DISPOSAL

Impacts related to the ocean disposal of dredged material are confined mainly to temporary water column impacts and longer-term benthic impacts.

### *3.1.1 WATER COLUMN IMPACTS*

Impacts to Water Column EFH associated with disposal operations was included in the2004 ODMDS designation EFH Assessment and is incorporated by reference. There are no differences expected due to the expansion of the site.

### *3.1.2 BENTHIC IMPACTS*

As previously stated in the2004 ODMDS designation EFH Assessment, dredged material disposal at the proposed ODMDS expansion is not expected to result in any significant changes in regional bottom topography or sediment transport processes or adverse environmental impact. Dredged material must undergo whole-sediment bioassays to demonstrate compliance with the Ocean Dumping Criteria (40 CFR 2277) prior to ocean disposal. Bioassays are used to determine the biological availability, of and potential for, impact of contaminants associated with dredged material. Therefore, no adverse impacts associated with contaminants in the dredged material are anticipated.

However, accumulation of dredged material and associated changes in the sediment characteristics may cause impacts to benthic-dwelling organisms. Surface sediments at the proposed ODMDS expansion areas consist of primarily sand (55.7 to 64.9 percent, by weight) with 49 to 54.3 percent of this as fine sand. Silt and clay represent 35.1 to 44.3 percent (ANAMAR 2012). This composition could undergo changes from deposition of dredged material. Grain size analysis conducted for samples taken in 2011 from the Port Everglades Harbor were described as predominantly dark gray find sand, greenish gray silty fine sand, and dark gray sandy silt. These samples represent maintenance material with an overall sand content from 17%-81%, silt from 12%-49%, and clay content ranged from 5%-34%. Exact content and percentages of material from new work material at the Port Everglades Harbor is current unknown however is expected to consist of ranging percentages of silt, sand, gravel, cobble, and boulder-sized components.

Surveys were conducted in May 2006 after the August 2005 disposal of approximately 60,000 cubic yards of maintenance material from the north extension turning basin within Port Everglades Harbor (Germano & Associates, Inc. 2006). This material was approximately 40 percent silts/clays and was disposed from a pre determined circular disposal release zone within the center of the ODMDS. The overall footprint of the dredged material formed an uneven ellipse elongated in the north-south direction; this was attributed to the influence of the Florida Current (Figure 5). The maximum measured thickness of the dredged material layer was 6.4 cm. Actual thicknesses could be greater. The thickest layers of dredged material were located just north of the disposal zone; thickness generally decreased to the north, except for four stations near the northern boundary of the ODMDS. The dredged material was darker in color with a higher proportion of fine sand (3 to 2 phi), dark patches of silt, and/or the presence of small white shell fragments (Germano & Associates, Inc. 2006). This resulted in a shift to a slightly sandier substrate at the ODMDS. Results suggested that while benthic communities over the dredged material deposit were rapidly approaching those on the ambient seafloor relatively soon after disposal, this process was still ongoing at the time of the survey and not yet complete. Figure 15 shows the overlay of the 2005 dredged material disposal footprint over the potential hardbottom areas.

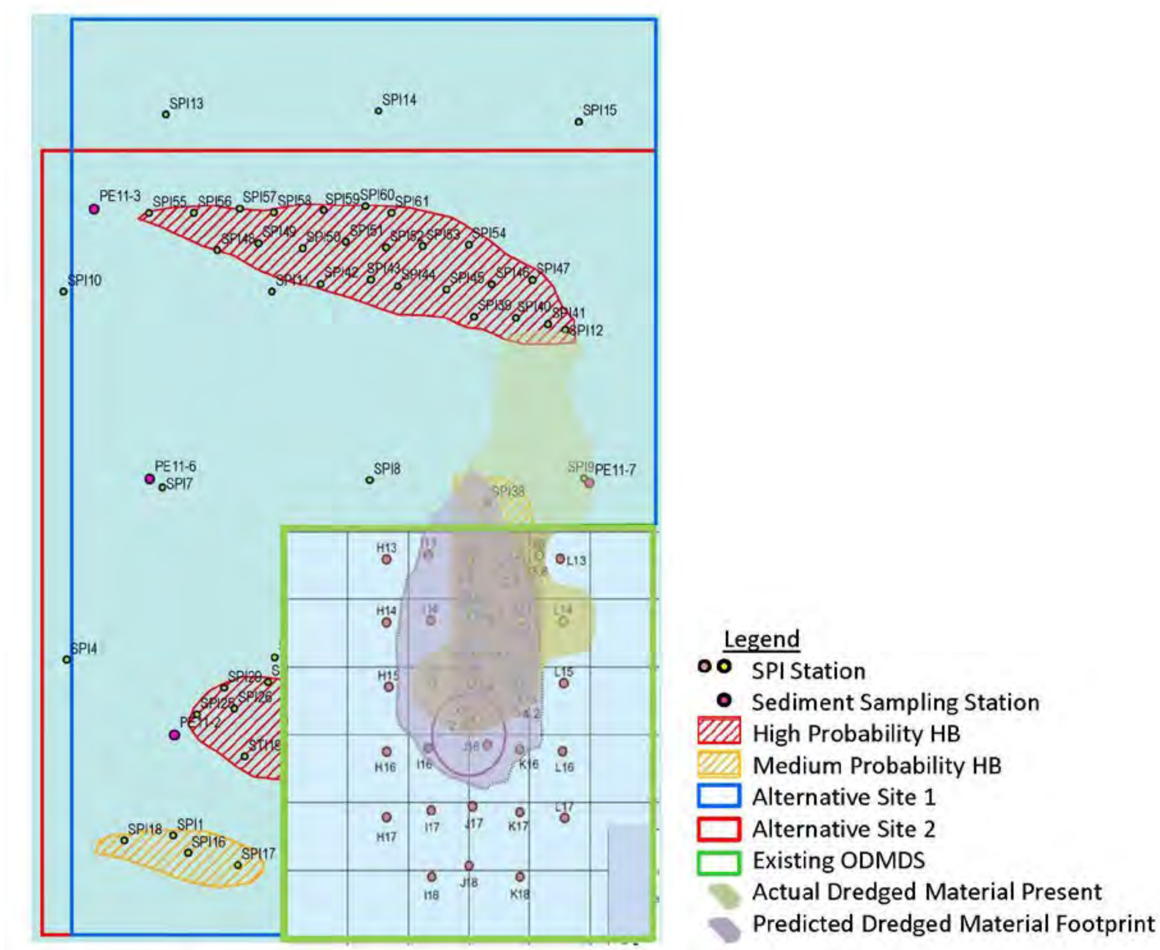



**Figure 15. Overlay of dredged material footprint over potential hardbottom areas. Light green and purple shapes show overlay of predicted and actual dredged material footprint from 2006 maintenance dredge disposal event over potential hardbottom areas.**

As dredged material accumulates on the sea floor, benthic organisms in the area of initial deposition may be impacted. Disturbances that occur more frequently than once per year tend to keep the colonizing benthos in an early successional stage, whereas burial frequencies of less than one year allow colonization of higher order successional species (Rhoads *et al.* 1978)..

Recolonization of a disposal mound can begin within a few days after dumping (Germano and Rhoades 1984). Adults buried under thin overburden layers (<10cm) have an upward escape response. The thicker part of the deposit is primarily recolonized through larval recruitment or immigration of organisms from adjacent, undisturbed areas. Macroinfaunal recolonization occurs in three phases: (1) small opportunistic polychaetes; (2) dense aggregations of tubiculous amphipods and tellinid bivalves; and (3) deep burrowing polychaetes, caudate holothurians, infaunal ophiuroids, or burrowing urchins (Rhoads and Germano 1986). Larval recruitment and establishment by all stages following disposal can require several years (Rhoads *et. al* 1978). However, tropical soft-bottom macrobenthic assemblages can respond quickly (three months) to the disturbance associated with the dumping of dredged material (Cruz-Motta and Collins 2004). Rapid rates of recovery may be driven by migration of organisms from adjacent non-affected patches within the disposal area.

After dredged material disposal, relatively motile pelagic megafauna would likely be most affected when suspended sediments from the disposal plume cause displacement by avoidance or escape behavior. Slow-moving epifaunal invertebrates may be buried and smothered as dredged material is deposited. Recovery and recolonization of an impacted area will depend on the frequency and severity of the disturbance and the species involved. Some organisms may recover within hours to days, but full recovery could require a few years (EPA 1993).

Approximately nine months after disposal at the existing ODMDS, Stage 2 and increasing numbers of Stage 3 communities recolonized the area; this largely represented a return to ambient conditions relatively soon following disposal (Germano & Associates, Inc. 2006). Germano & Associates, Inc. (2006) suggested that the native benthic communities in the ODMDS are subjected to high current velocities and are adapted to frequent physical disturbance, thus having relatively rapid recolonization.

Multi-dump fate (MDFATE) modeling was conducted on the 6.63 million cubic yards of dredged material estimated to come from the proposed Port Everglades Harbor deepening project. The model estimated the area and thickness of material deposition when disposed from a pre determined disposal release zone within Alternative 1 and Alternative 2. Contours were developed to show the estimated area covered by both five (5) and ten (10) centimeter dredged material thickness layers (Table 6). The amount of seafloor expected to be covered by more than 5 but less than 10 cm of dredged material for Alternative 1 is approximately 0.36 nmi$^2$ (230 acres). The amount of seafloor expected to be covered by greater than 10 cm for Alternative 1 is approximately 1.06 nmi$^2$ (678 acres). For Alternative 2, the amount of seafloor expected to be covered by more than 5 but less than 10cm is approximately 0.39 nmi$^2$ (250 acres). The amount of seafloor expected to be covered by greater than 10 cm for Alternative 2 is approximately 1.33 $nmi^2$ (851 acres). Both alternatives include a portion of the existing site in the coverage estimate.

**Table 6. Estimated area of dredged material deposition**

| | Total Site Size (ac) | Estimated area (ac) covered by 5 to less than10 cm material | Estimated area (ac) covered by ≥10 cm material |
|---|---|---|---|
| Alternative 1 | 2,721 | 230 (8.5%) | 678 (25%) |
| Alternative 2 | 2,449 | 250 (10.0%) | 851 (34.7%) |

The contours were overlaid on the cultural resources side-scan sonar mosaic to examine the number of targets covered by the 5 cm and 10 cm layers for Alternative 1 (Figure 16) and Alternative 2 (Figure 17). To be as conservative as possible, USACE and EPA classified all non-manmade targets detected in the survey as “hardbottom”. The size of each target was calculated and the total area of potential hardbottom affected by the estimated material deposition tabulated for both alternatives (Table 7).

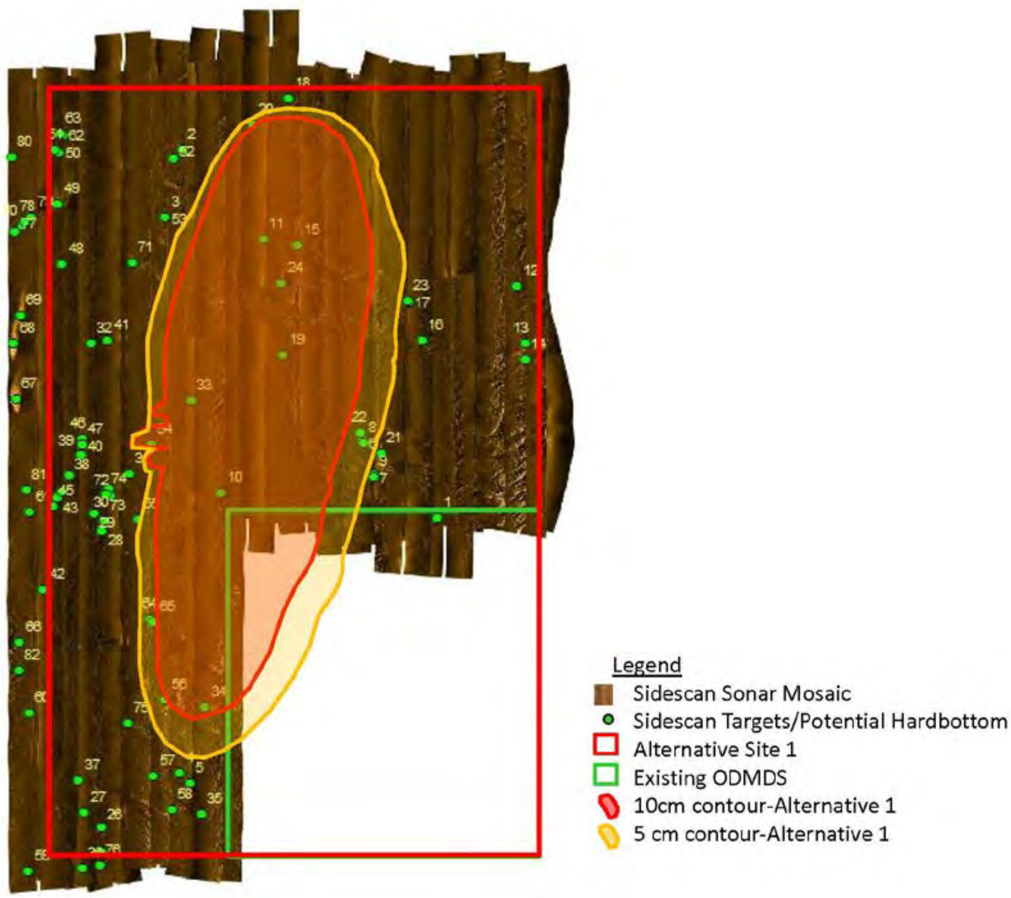



**Figure 16. Overlay of predicted disposal footprint for Alternative 1 on potential hardbottom targets as identified from sidescan sonar mosaic. 10 and 5 cm contours indicate dredged material layer thickness**

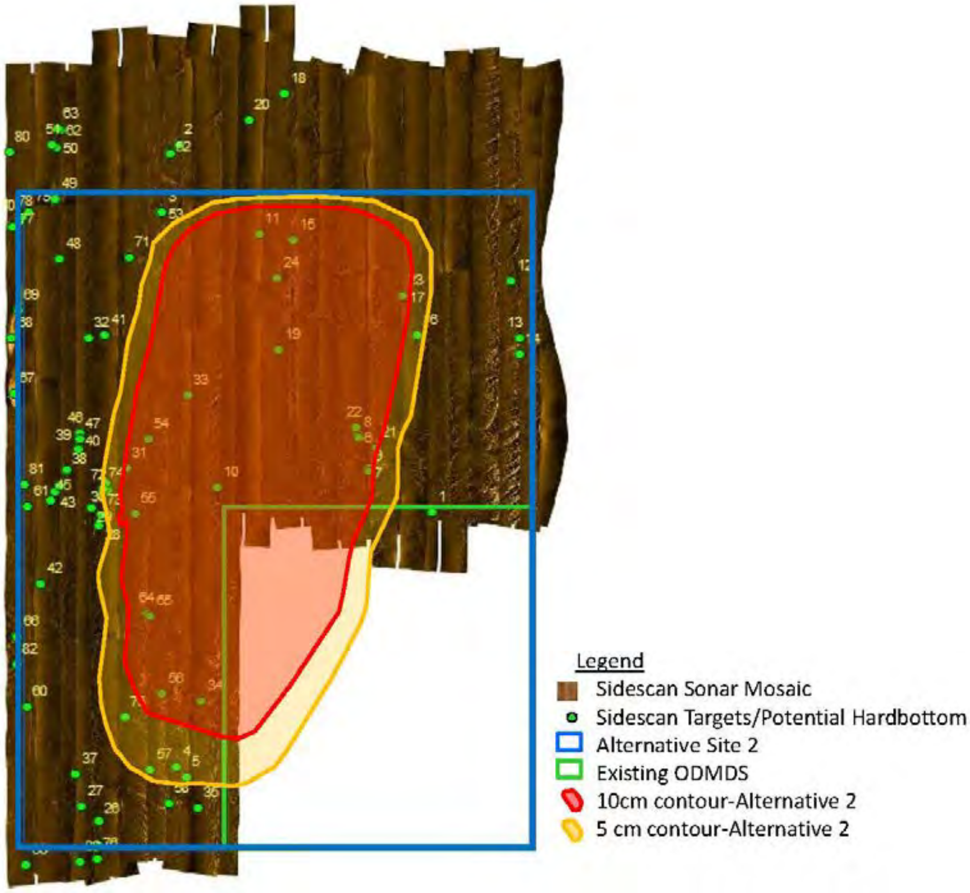



**Figure 17. Overlay of predicted disposal footprint for Alternative 2 on potential hardbottom targets as identified from sidescan sonar mosaic. 10 and 5 cm contours indicate dredged material layer thickness.**

**Table 7. Total area of potential hardbottom affected by the estimated material deposition**

| | Total Site Size (ac) | Targets (ac) covered by 5 to less than10 cm material | Targets (ac) covered by ≥10 cm material |
|---|---|---|---|
| Alternative 1 | 2,721 | 1.33 (0.05%) | 1.36 (0.05%) |
| Alternative 2 | 2,449 | 1.41 (0.06%) | 2.89 (0.12%) |

## 3.2 OVERVIEW OF CUMULATIVE IMPACTS

Cumulative impacts in the vicinity of the proposed ODMDS expansion were discussed in the *Environmental Impact Statement for Designation of the Port Everglades Harbor ODMDS* (EPA

2004, as well as the *Environmental Assessment for Ongoing Operations and Maintenance Dredging of Port Everglades* (USACE, 2005). Information included in those analyses is incorporated by reference. However, where changes have occurred since the original analysis, a new discussion is included.

Cumulative impacts included effects of navigational dredging projects, beach renourishment projects, and wastewater outfalls. Only the navigation and sand bypass projects which would utilize the ODMDS are likely to have impacts to the EFH potentially impacted by this ODMDS site expansion. In addition, other ODMDSs in the area are likely to have similar impacts.

Similar and unrelated actions occurring in the vicinity of the action area include navigation, channel maintenance, commercial and recreational fishing, sand borrow areas, and shipping traffic. Past projects include the designation of the existing Port Everglades ODMDS, including its ongoing use. Current projects include the maintenance of the Port Everglades Harbor Federal Navigation channel and storm damage reduction efforts associated with the Broward County Shore Protection Project. Reasonably foreseeable future actions include the Port Everglades Harbor deepening and expansion projects, the Southport Turning Notch Improvement, the Port Everglades Entrance Sand Bypass Project, and the designation and use of sand borrow areas for the Broward County Shore Protection Project. Additional potential projects include offshore wind and hydrokinetic facilities.

The designation of an expanded ODMDS is not expected to introduce new human activities in the project vicinity. Commercial shipping and recreational and commercial fishing are expected to continue. Increased vessel traffic associated with the construction of the Port Everglades Harbor Deepening Project may lead to an increased risk of collisions with vessels transiting to and from the ODMDS expansion areas during construction activities. This increase in vessel traffic will be limited to the construction period. The increased vessel traffic associated with these projects may also affect water quality at a greater frequency than existing circumstances. These effects are expected to be temporary.

### *3.2.1 NAVIGATION IMPROVEMENTS TO THE FEDERAL PROJECT AT PORT EVERGLADES HARBOR*

A feasibility study and environmental impact statement are currently underway for navigation improvements to the Federal Navigation Project at Port Everglades Harbor, including channel and basin deepening and widening, that may be required to increase safety for the existing and future fleet and more efficiently handle current and future shipping demands. The Preferred Alternative is for an Outer Entrance Channel 57 feet deep (plus one foot of required overdredge and one foot of allowable overdredge for a total dredge depth of -59 ft MLLW) from the sea buoy to the jetties then transitioning to an Inner Entrance Channel at 50 feet deep (plus one foot required overdredge and one foot allowable overdredge for a total dredge depth of -52 ft MLLW). The channel depth of 50 feet (-52 ft total dredge depth) continues into the Main Turning Basin, Widener, Southport Access Channel, and Turning Notch (deepening only from -46 to -50 feet plus one foot of required overdredge and one foot of allowable overdredge for a total dredge depth of -52 ft MLLW; See section 3.2.2 for more information). The South Turning Basin and Dania Cutoff Canal improvements are not included in the Preferred Alternative.

The Preferred Alternative may generate approximately 6.63 million cubic yards of dredged material. A small portion of the material will be utilized for construction of mitigation measures with the remaining portion of the material being placed in the ODMDS (Jerry W. Scarborough, USACE, personal communication, letter dated Apr. 27, 2010). The analysis assumes that the Turning Notch would be improved by Port Everglades to provide a depth of 42 feet. The Preferred Alternative includes deepening approximately 1,500 linear feet of the turning notch from the existing 42 feet to 50 feet (plus one foot of required overdredge and one foot of allowable overdedge for a total dredge depth of -52 ft MLLW). Impacts from ocean disposal would be similar to that as described in Section 3.0; however, the total seafloor area to be impacted would be a function of the total volume of material for disposal.

### *3.2.2 PORT EVERGLADES HARBOR EXPANSION PROJECT (SOUTHPORT TURNING NOTCH EXPANSION BY PORT EVERGLADES)*

The Turning Notch would be expanded by Port Everglades to provide a depth of -42 feet to accommodate larger ships and create additional berth space for the current class cargo ships calling at Port Everglades. This project is included in the Port's five-year Capital Improvement Program from the 2006 Port Everglades Master/Vision Plan. Material dredged from the Turning Notch expansion will go to an upland site, and will not be disposed of in the ODMDS (Port Everglades, personal communication, 2012).

### *3.2.3 PORT EVERGLADES ENTRANCE SAND BYPASS PROJECT*

The Port Everglades Sand Bypass Project proposes to create and modify inlet infrastructure on the north side of the inlet sufficient to facilitate the economical collection of littoral materials that will be available for future mechanical bypassing to the beaches south of the inlet. The project will include the creation of a sand trap, modification to and improvement of the existing north jetty, removal of a portion of the rubble spoil shoal north of the inlet, construction of a rock rubble barrier at the western extent of the remaining rubble shoal, and construction of a small interior groin on the western end of the north jetty notch.

A primary component of the sand bypass project will be a 7.1 acre (2.87 hectare) sand trap excavated to an elevation of -49 ft (-14.9 meters), NAVD88. The sand trap will be located on the north side of the Port Everglades Entrance channel immediately adjacent to the north jetty.

Creation of the sand trap will include the excavation of approximately 325,000 cubic yards (248,500 cubic meters) of sand, rubble, and rock. Of this, it is expected that up to 45,000 cubic yards (34,400 cubic meters) of the material is a mixture of beach compatible sand and rock rubble. The balance of the material is limestone (carbonate) rock of varying characteristics and granite boulders and granite stone debris from the old jetty. An attempt will be made to recover and re-use some if not all of the collected boulders along sections of the planned jetty improvements. Otherwise, these materials will be disposed of in the ODMDS.

This project would also include removal of approximately 125,000 cy (95,600 cubic meters) of rubble from the rubble spoil shoal located approximately 800 ft (243 m) north of the north jetty down to natural hardbottom or a maximum depth of about -20 ft (-6.1 m) NAVD88. The material will be loaded onto scows and towed offshore to the ODMDS for disposal. Impacts from ocean disposal would be similar to that as described in Section 3.0; however, the total seafloor area to be impacted would be a function of the total volume of material for disposal. In addition, material from this project would likely consist of rubble and boulders.

#### *3.2.4 OFFSHORE WIND AND HYDROKINETIC FACILITIES*

The Bureau of Ocean Energy Management (BOEM) issues leases and grants for both offshore wind and hydrokinetic projects. BOEM permits the construction and operation of offshore wind farms; however, FERC permits the development of hydrokinetic facilities. BOEM is preparing an Environmental Assessment for the proposed lease of OCS blocks 7003, 7053, and 7054 (BOEM Notice of Intent dated May 24, 2011). However, those areas were determined to be outside of the ODMDS expansion area. Florida Atlantic University (FAU) is requesting leases for additional OCS blocks (blocks 7040 and 7001) that could overlap with the ODMDS expansion area.

Florida Atlantic University has applied to BOEM for a lease to deploy an experimental demonstration device about 17 miles off the coast of Fort Lauderdale. The Southeast National Marine Renewable Energy Center, operated by FAU, is exploring the potential for harnessing the Florida Current. A single-anchor mooring and buoy would be used to test equipment that could generate electricity from the Florida Current. Devices to be deployed would be limited to 100 kilowatts of capacity and 23-foot-diameter rotors.

The BOEM prepared “Final Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf” in 2007 reviewing the potential impacts associated with offshore current energy. Impacts associated with these devices on fish and EFH were discussed in Section 5.2.11 of the EIS and include an assessment of impacts associated with construction, operations, and decommissioning on fishes and EFH as well as mitigation measures that may be put in place by

BOEM to minimize impacts associated with these devices. This analysis is incorporated by reference (BOEM. 2007).

### *3.2.5 BROWARD COUNTY SHORE PROTECTION PROJECT*

The Broward County Shore Protection Project Segment I is from the north county line to Hillsboro Inlet. The 11.3 miles of Segment II shoreline between Hillsboro Inlet and Port Everglades includes the cities of Pompano Beach, Lauderdale-by-the-Sea, and Fort Lauderdale. The 8.2 miles of Segment III shoreline between Port Everglades and the Miami-Dade County Line includes John U. Lloyd Beach State Park and the cities of Dania Beach, Hollywood, and Hallandale. Offshore sand borrow areas and upland mines have been used to construct the beach fill element of the project. Broward County and USACE completed an EIS on for the Broward County Shore Protection Project, Segments II and III in 2003. Section 4.6 of the EIS discussed the potential impacts to designated EFH associated with that project and is incorporated by reference (USACE 2003).

### *3.2.6 USE OF OTHER OCEAN DREDGED MATERIAL DISPOSAL SITES*

Other ODMDS' in southeast Florida off the continental shelf include the Miami ODMDS and the Palm Beach Harbor ODMDS. A recent reconnaissance study by the USACE recommended that deepening the existing Federal project at Palm Beach Harbor was justified. Up to 1,000,000 cubic yards of dredged material could result from dredging a proposed project at Palm Beach Harbor. Monitoring following disposal from the Miami Harbor Deepening Project at the Miami ODMDS showed a shift in grain size at the site to a coarser material (Collins and Pruitt 2001). The median grain size of native sediments was in the range of 0.01-0.04 mm. The median grain size after disposal increased (to 0.05-0.1 mm). Impacts at these ODMDSs are expected to be similar to that described in Section 3.0. All ODMDS sites are designed to limit impacts to the area within the ODMDS boundaries. The actual extent of impact will mostly depend on the volume of the disposal project.

### *3.2.7 CONTINUED USE OF THE EXISTING ODMDS SITE*

Under the "No Action Alternative" for the expansion of the Port Everglades ODMDS EA currently in preparation, the existing site will continued to be used, and the effects on EFH within the boundaries of the existing site as discussed in the 2004 EFH assessment will continue to occur for the foreseeable future. USACE assessed the frequency of dredging the port at once every five years (USACE, 2005) however, shoaling rates in the entrance channel have been increasing as the filet north of the channel has filled, allowing sand to bypass around the north jetty and into the entrance channel. As stated in the 2005 EA completed by USACE for O&M dredging of the federal navigation project, if there is insufficient capacity to place that sand on the downdrift beach, the dredged material will be placed in the ODMDS.

### 3.3 EFFECTS OF ODMDS EXPANSION ON EFH

As discussed in Section 2.1, designation of disposal sites does not allow ocean disposal of dredged material. The transportation of dredged material for disposal into ocean waters (the actual use of the designated site) is permitted by the USACE, or authorized in the case of Federal Civil Works navigation projects under Section 103 of the MPRSA. Therefore, the evaluation of potential effects is limited to *typical* disposal site use. Effects of activities beyond the scope of this evaluation (such as large new work projects) should be evaluated separately.

Disturbance from ships transiting through the area would not be significantly different from normal vessel operations that occur daily in the action area, although during disposal activities there would be an increase in vessel activity in the area between the harbor entrance and the proposed ODMDS expansion areas.

The effects on the habitats of following managed species will be addressed:

- Royal Red Shrimp
- Golden Crab
- Snapper-Grouper Complex (yellowedge grouper, Warsaw grouper, blackfin snapper, golden tilefish, and blueline tilefish)
- Highly Migratory Species
- Coral, Coral Reefs, and Live/Hardbottom Habitat
- Spiny Lobster

#### *3.3.1 ROYAL RED SHRIMP*

Effects are not expected to differ from that discussed in the 2004 EFH Assessment with the exception of total area impacted. See Table 6 for estimates of the total area of soft bottom habitat expected to be affected by burial.

#### *3.3.2 GOLDEN CRAB*

EFH for the golden crab includes the U.S. Continental Shelf from Chesapeake Bay south through the Florida Straits, and into the Gulf of Mexico. In addition, the Florida Current/Gulf Stream is EFH because it provides a mechanism to disperse crab larvae. Offshore, unconsolidated bottom, including ripple habitat, dunes, soft bioturbated habitat, and low relief outcrops are EFH for golden crab (NMFS 2011). Golden crabs were observed by Reed and Farrington (2010) in depths from 247 to 888 m with a peak in numbers between 300 and 500; densities were twice as great on soft muddy-sand substrate compared to hard bottom, either coral or rock.

Recent surveys in the ODMDS expansion areas indicate that little potential exists for medium to high profile outcroppings within or immediately adjacent to the proposed ODMDS (ANAMAR 2012). Some low-relief hardbottom/live bottom or patch reefs are possible within the limited rubble areas. Dredged material disposal may bury the bottom habitat and less-motile fauna and affect feeding. Disposal could increase turbidity levels, potentially clogging gills of organisms and altering behavior patterns and feeding. Deposition of material with higher silt content could alter the sandy bottom type in the disposal areas. Golden crabs can utilize a variety of bottom types including substrates containing a mixture of silt-clay and foraminiferan shell, unconsolidated bottom, including ripple habitat, dunes, soft bioturbated habitat, and low relief and any effects on golden crab are likely to be minimal and temporary. Any dredged material consisting of rock or gravel that is disposed in association with construction projects (e.g., Port Everglades Harbor Deepening Project) may replace any buried low-relief outcrops. Ripple habitat, dunes, and soft bioturbated habitat are present in the ODMDS expansion areas. Softbottom habitat and low-relief habitat in some portions of the ODMDS expansion areas would be covered by dredged material.

Adverse impacts are not expected to the Florida Current/Gulf Stream and if they occur would be temporary and minor because dredged material must undergo liquid and suspended phase toxicity testing and must meet the applicable water quality criteria.

### *3.3.3 SNAPPER-GROUPER COMPLEX*

#### 3.3.3.1 Yellowedge Grouper, Warsaw Grouper, and Blackfin Snapper

Effects are not expected to differ from those discussed in the 2004 EFH Assessment with the exception of total area impacted (see Table 7). Surveys conducted within the expansion area are discussed in Section 2.0. The surveys indicate that there exists little potential for coral reefs, submerged aquatic vegetation, artificial reefs, or medium to high profile outcroppings within the proposed expanded portion of the ODMDS. Limited hard bottom areas are present. With the exception of the limited hardbottom/rubble areas, these categories of EFH are not expected to be affected. The limited hard bottom areas will be significantly affected through burial. However and dredged material that consists of rock or gravel associated with new work projects may replace the buried structure. Boulders will be disposed in an area unlikely to be buried by dredged material (see SMMP).

#### 3.3.3.2 Golden Tilefish

Effects are not expected to differ from that discussed in the 2004 EFH Assessment with the exception of total area impacted (see Table 7).

The only potential habitat for the Golden tilefish is the widely scattered rubble areas in the expansion area. The habitat associated with any of the slight ridges or rubble areas present in the proposed ODMDS expansion areas would likely be significantly affected by ODMDS expansion through burial. However, any dredged material that consists of rock or gravel that may be disposed in association with construction projects (e.g., Port Everglades Harbor Deepening Project) may replace the buried structure and provide new habitat for any golden tilefish that may be present. The USACE and the EPA therefore believe that the designation of the proposed ODMDS expansion would only have a minor affect on potential golden tilefish benthic habitat.

#### 3.3.3.3 Blueline Tilefish

Effects are not expected to differ from that discussed in the 2004 EFH Assessment with the exception of total area impacted.

### *3.3.4 HIGHLY MIGRATORY SPECIES*

Effects are not expected to differ from that discussed in the 2004 EFH Assessment with the exception of total area impacted.

### *3.3.5 CORAL, CORAL REEFS, AND LIVE/HARDBOTTOM HABITAT*

EFH in the vicinity of the proposed ODMDS expansion for coral, coral reefs and live/ hardbottom includes rough, hard, exposed, stable substrate. Surveys conducted at the site indicate that there is little potential for coral reefs, or medium to high profile outcroppings within or adjacent to, the proposed ODMDS expansion areas. However, possible live/hardbottom associated with rubble areas within the proposed ODMDS expansion areas is possible. The quantity of hard bottom habitat has been conservatively estimated and is presented in Table 7. Direct impacts are limited to these areas. Any rubble areas could be significantly affected by burial; however, rubble could be contained in dredged material.

Areas which meet the criteria for essential fish habitat-habitat areas of particular concern (EFH-HAPCs) for coral, coral reefs, and live/hard bottom in the vicinity of the proposed expansion sites include the Stetson Reefs, Savannah and East Florida Lithoherms, and Miami Terrace (Stetson-Miami Terrace) HAPC, located approximately 0.5 nmi east of the southeastern corner of the existing ODMDS and subsequently the expansion areas, since they share the common boundary.

Potential indirect effects include transport of disposal plumes shoreward towards the nearshore reefs in less than 30 meters (100 ft) of water. The outermost reefs are located approximately 2.5 nmi (4,630 meters) west of the center [1.8 nmi (3,333 meters) west of western edge] of the proposed ODMDS expansion area . By expanding the sites with either alternative, the western edge of the expanded ODMDS will be approximately 0.5 nmi (926 meters) closer to the third reef line than it is with the existing ODMDS boundaries. The potential for turbidity plumes to reach these areas was evaluated by the USACE. Extreme (99 percentile) westerly currents were modeled and silt-clay concentrations were predicted to diminish rapidly to less than 1 mg/l within 1,500 meters of the disposal location. Sand concentrations were predicted to diminish to less 1 mg/l within 2,400 meters (CERC 1998). As part of the monitoring efforts associated with the Miami ODMDS, located a similar distance offshore and with a similar relationship to the Florida Current, currents were monitored for exceedence of a 12 cm/sec (1 hour average) shoreward threshold. The 12cm/sec threshold was determined as the velocity necessary to transport plumes to the nearshore reefs (Proni *et al.* 1998). Evaluation of more than a year's worth of records determined that the 12 cm/sec threshold was only exceeded 2.5 percent of the time (Proni *et al.* 1998). Most of these exceedences were only short duration (<2 hrs) and only 11 exceeded five hours. Therefore, the potential for indirect effects on the nearshore reefs is minimal.

Based on the photographic and side scan sonar data for estimated hardbottom as presented in section 3.1.2, Alternative 1 is the less impactful alternative with regard to hardbottom EFH.

### *3.3.6 SARGASSUM*

Effects are not expected to differ from those discussed in the 2004 EFH Assessment with the exception of total area impacted.

### *3.3.7 SPINY LOBSTER*

Effects are not expected to differ from those discussed in the 2004 EFH Assessment with the exception of total area impacted.

# 4 PROPOSED MITIGATION

The Port Everglades ODMDS was originally sited to minimize impacts to hardbottom. The ODMDS expansion area alternatives were also sited to minimize hardbottom impacts. Direct and indirect effects on the water column and the Florida Current/Gulf Stream would be mitigated through adequate testing of the liquid and elutriate phases of the dredged material proposed for disposal at the proposed ODMDS expansion areas. Direct and indirect effects on the benthos would be mitigated through adequate testing of the solid phase of the dredged material. Testing will assure that use of the proposed ODMDS expansion areas would present no significant damage to the resources of the marine environment and no unacceptable adverse effects on the marine ecosystem (40 CFR 227.4).

The existing ODMDS and proposed ODMDS expansion areas were sited to minimize effects to hardbottom. Disposed dredged material areal impact would be limited to the ODMDS expansion areas by use of a limited disposal zone as specified in the SMMP. Bathymetric surveys following significant disposal events would monitor the extent of the disposal mound. In addition, the SMMP was modified to change the disposal release zone and disposal technique. Sediment profile imaging (SPI) was used in 2006 after the 2005 disposal of approximately 60,000 cubic yards of maintenance material to map the extent of the disposal mound beyond that which is detectable by acoustic measurements. The EPA and the USACE also propose to include monitoring of the benthic recovery rate using the SPI technique. SPI can be used to identify major changes in grain size and infaunal successional stage (Rhoads and Germano 1982) and additional information on the areal extent of benthic impact and on the rate of recovery from major disposal events.

The 2006 Post-Disposal SPI mapping determined that the dredged material released within the disposal zone in 2005 was transported northward during its descent through the water column and was deposited in increasingly thinner layers on the seafloor (Germano & Associates 2006). The dredged material was generally slightly sandier, had a darker color, and had higher amounts of fine shell hash. At some stations, the dredged material also contained patches of dark silt. Most stations did not appear to have adverse changes in oxygen demand, redox state, or other geochemical properties. In May 2006, the areas affected by the August 2005 disposal were found to have benthic recolonization at intermediate (Stages 2 or 2 going to 3) to advanced (Stage 2 or 3) stages. The recolonization community consisted of surface and sub-surface infauna. Germano & Associates (2006) suggested that the benthic community in the area of the proposed ODMDS expansion is adapted to frequent physical disturbance due to high current velocities in the general area.

Burial of the small rubble zones could be unintentionally mitigated through dredged material disposal. New work construction projects such as those currently proposed (Port Everglades

Harbor Deepening Project) typically have significant amounts of rubble limestone associated with them. Larger material is typically used for beneficial use. However, smaller material or material that cannot be economically separated from the dredged material must be disposed of. For example, numerous mounds of limestone gravel were created at the Miami ODMDS as a result of dredged material disposal (McArthur 1998; Collins and Pruitt 2001). Such disposal could create additional hard substrate to replace that buried by routine maintenance events.

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# APPENDIX D.

## SITE MANAGEMENT AND MONITORING PLAN



**DRAFT ENVIRONMENTAL ASSESSMENT**
**ON THE**
**EXPANSION OF THE PORT EVERGLADES HARBOR**
**OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)**
**BROWARD COUNTY, FLORIDA**

The following Site Management and Monitoring Plan for the Port Everglades Harbor ODMDS has been developed and agreed to pursuant to the Water Resources Development Act Amendments of 1992 (WRDA 92) to the Marine Protection, Research, and Sanctuaries Act of 1972 for the management and monitoring of ocean disposal activities, as resources allow, by the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers.

| | | | |
|---|---|---|---|
| __________________________ | _________ | ____________________ | _________ |
| Colonel Alan M. Dodd<br>District Commander<br>Jacksonville District<br>U.S. Army Corps of Engineers<br>Jacksonville, Florida | Date | A. Stanley Meiburg<br>Acting Regional Administrator<br>U.S. Environmental Protection Agency<br>Region 4<br>Atlanta, Georgia | Date |

This plan is effective from the date of signature for a period not to exceed 10 years. The plan shall be reviewed and revised more frequently if site use and conditions at site indicate a need for revision.

**DRAFT**
**PORT EVERGLADES HARBOR**
**OCEAN DREDGED MATERIAL DISPOSAL SITE**
**SITE MANAGEMENT AND MONITORING PLAN**

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## 1.0 INTRODUCTION

It is the responsibility of the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) under the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 to manage and monitor each of the Ocean Dredged Material Disposal Sites (ODMDSs) designated by the EPA pursuant to Section 102 of MPRSA. Section 102(c)(3) of the MPRSA requires development of a Site Management and Monitoring Plan (SMMP) for each ODMDS and review and revision of the SMMP not less frequently than every 10 years. The 1996 document, *Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites* (EPA/USACE, 1996) and the EPA Region 4 and USACE South Atlantic Division Memorandum of Understanding (EPA/USACE, 2007) have been used as guidance in developing this SMMP.

A SMMP was originally developed as part of the designation process and was published in November 2004 as part of, *Final EIS for Designation of the Palm Beach Harbor Ocean Dredged Material Disposal Site and the Port Everglades Harbor Ocean Dredged Material Disposal Site,* (EPA, 2004), with SMMP revisions in May 2009. The current revision to the Port Everglades Harbor ODMDS SMMP incorporates the expanded boundaries of the ODMDS. The SMMP provisions shall be requirements for all dredged material disposal activities at the site. All Section 103 (MPRSA) ocean disposal permits or contract specifications shall be conditioned as necessary to assure consistency with the SMMP.

1.1 Site Management and Monitoring Plan Team. An interagency SMMP team was established to assist EPA and USACE in developing the 2004 Port Everglades ODMDS SMMP. The team consisted of the following agencies and their respective representatives:

- Jacksonville District U.S. Army Corps of Engineers
- EPA Region 4
- Port of Port Everglades
- State of Florida (Coastal Zone Management Office)
- National Oceanographic and Atmospheric Administration (NOAA)
- U.S. Coast Guard, Station Fort Lauderdale

These agencies will continue to be consulted in revisions to the Port Everglades Harbor ODMDS SMMP and will be asked to participate where appropriate. The team will assist EPA and USACE on deciding on appropriate disposal practices, appropriate monitoring techniques, the level of monitoring, the significance of results and potential management options.
Specific responsibilities of EPA and the Jacksonville District Corps of Engineers are:

EPA: EPA is responsible for designating/de-designating MPRSA Section 102 Ocean Dredged Material Disposal Sites, for evaluating environmental effects of disposal dredged material at these sites and for reviewing and concurring on dredged material suitability determinations.

USACE: USACE is responsible for evaluating dredged material suitability, issuing MPRSA Section 103 permits, regulating site use and developing and implementing disposal monitoring programs.

## 2.0 SITE MANAGEMENT

Section 228.3 of the Ocean Dumping Regulations (40 CFR 220-229) states: "Management of a site consists of regulating times, rates, and methods of disposal and quantities and types of materials disposed of; developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation studies; and recommending modifications in site use and/or designation." This plan may be modified if it is determined that such changers are warranted as a result of information obtained during the monitoring process.

### 2.1 Disposal Site Characteristics
Alternative 1 (preferred Alternative):

The designation of the expanded Port Everglades Harbor ODMDS will be published in 40 CFR Section 228.15(h). Coordinates in the CFR are provided in NAD 83. The western edge of the expanded Port Everglades Harbor ODMDS (figure 1) is located 3.3 nautical miles (nmi) offshore and is 2.25 nmi by 1.43 nmi in size (3.21 nmi$^2$). As of 2012, it had a depth range of -184 to -224 meters (-604 to -735 feet), with an average depth of 206 meters (-675 feet). The site is centered at approximately 26°07.625'N latitude and 80°01.784'W longitude (NAD 83) or state plane coordinates 653067.2 ft N and 974516.7 ft E (NAD83). The site coordinates are as follows:

| | Geographic NAD 83 | | State Plane (Florida East 0901 U.S. Ft) NAD 83 | |
|---|---|---|---|---|
| | Latitude (North) | Longitude (West) | Easting | Northing |
| NE | 26°08.746'N | 80°00.981'W | 978,855.7 E | 659,889.0 N |
| NW | 26°08.756'N | 80°02.568'W | 970,178.0 E | 659,889.0 N |
| SW | 26°06.504'N | 80°02.587'W | 970,178.0 E | 646,242.9 N |
| SE | 26°06.493'N | 80°01.000'W | 978,855.7 E | 646,242.9 N |

Physical and biological conditions at the existing and expanded ODMDS are described in, *Final Environmental Impact Statement for Designation of the Palm Beach Harbor Ocean Dredged Material Disposal Site and the Port Everglades Harbor Ocean Dredged Material Disposal Site,* (EPA 2004) and the *Environmental Assessment on Expansion of the Port Everglades Ocean Dredged Material Disposal Sites (ODMDS) Broward County, Florida* (EPA, in press).

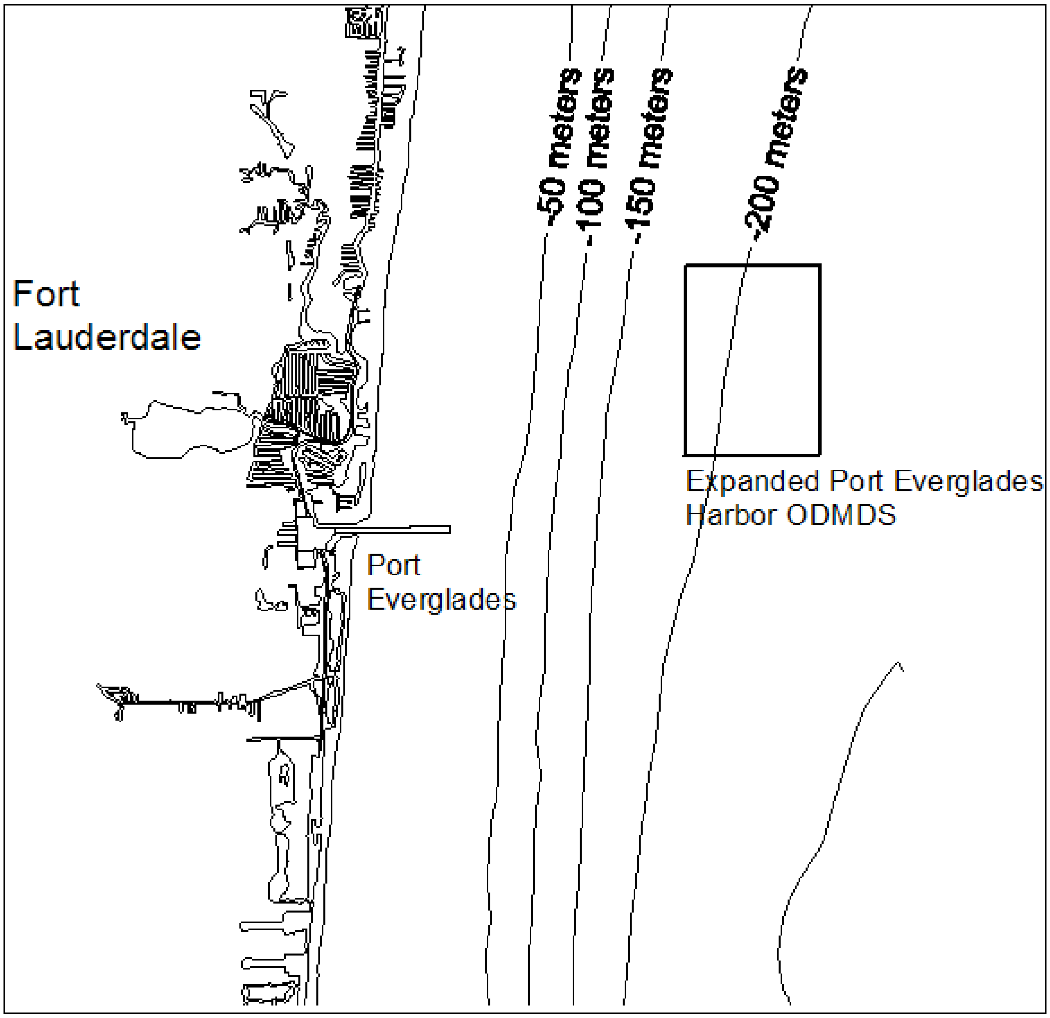


**Figure 1. Expanded Port Everglades Harbor ODMDS Location Map.**

2.2 Management Objectives. Appropriate management of an ODMDS is aimed at assuring that disposal activities will not unreasonably degrade or endanger human health, welfare, the marine environment or economic potentialities (MPRSA §103(a)). The primary objectives in the management of the Port Everglades Harbor ODMDS are:

- Protection of the marine environment;
- Documentation of disposal activities and compliance; and
- Maintenance of a long term disposal alternative for dredged material generated in the Port Everglades, Florida vicinity

The following sections provide the framework for meeting these objectives to the extent possible.

2.3 Disposal History and Dredged Material Volumes. It is intended that the expanded Port Everglades Harbor ODMDS will be used for placement of dredged material from both maintenance and new work projects from the greater Broward County, Florida vicinity. The primary user of the Port Everglades Harbor ODMDS is the U.S. Army Corps of Engineers for the Port Everglades Federal Navigation Project, including material from the Entrance Channel, Main, North, and South Turning Basins, South Access Channel and the Turning Notch. A secondary user is the Port Everglades Port Authority, including material from the South Turning Basin beyond Civil Works authorized depths, Port Slips, and Port Berthing Areas. Broward County has also proposed using the ODMDS for disposal material from the Port Everglades Sand Bypass Project (SAJ-2008-2034).

Historically, an interim site located approximately 1.6 nautical miles from shore was used for ocean disposal of dredged material from Port Everglades Harbor, but was discontinued in the 1980s.

The Port Everglades Harbor ODMDS was designated in 2005 approximately 4.3 nmi offshore. The ODMDS, 1 nmi$^2$ in size, was designated to accommodate dredged material from periodic maintenance events from the Port Everglades Harbor. The Jacksonville District Corps of Engineers estimated an annual average disposal rate of approximately 30,000 cubic yards of material. In 2005, 46,686 cubic yards of dredged material from Port Everglades Harbor was placed in this site. In 2013, 318,800 cubic yards of dredged material was disposed at the site. Potential navigation improvements may generate up to 6.63 million cubic yards of material requiring disposal at the ODMDS. MDFATE and STFATE modeling show the expanded 3.21 nmi$^2$ site sufficient to contain all of the estimated material from this construction project and continuing maintenance events. Maintenance volumes from the Port Everglades Federal Navigation Project are not expected to significantly increase and are expected to average approximately 300,000 cy over a ten year period.

**Table 1. Dredged Material Disposal Projects 2005-2013**

| Year | Volume (cy) | Dredge Area[1] | Dredge Method | Disposal Location | Sponsor |
|---|---|---|---|---|---|
| | | | | | |
| 2005 | 46,686 | NTB | Hopper | ODMDS[2] | Civil Works |
| 2013 | 265,900 | MTB, NTB, SAC, TN | Clam Shell | ODMDS[2] | Civil Works |
| 2013 | 52,900 | STB, Berth 19, 30 | Clan Shell | ODMDS[2] | Port Everglades |

[1] MTB (Main Turning Basin); NTB (North Turning Basin); STB (South Turning Basin); SAC (South Access Channel); TN (Turning Notch)
[2] Material disposed in 2005 designated Port Everglades ODMDS

2.4 Dredged Material Characteristics.

2.4.1 Previously Placed Materials. Materials placed in the Port Everglades Harbor ODMDS have historically consisted of sand, silt, clay, and a small amount of gravel. Material found suitable has been used for beach placement when feasible.

2.4.2. Anticipated Materials. Two basic sources of material are expected to be placed at the site; new work dredged material and maintenance material. These materials will consist of mixtures of silt, sand, gravel, cobble, and boulder sized components in varying percentages. Dredged material found suitable is anticipated to be placed on the beach area when feasible rather than the ODMDS.

2.4.3 Associated Beach Quality Materials. USACE Beneficial Use of Dredged Material EM 1110-2-5026 requires dredged material be maximized within the coastal system. Dredged materials that qualify for beach or near-shore placement per the FDEP's 'Sand Rule' shall be beneficially placed in such location, to the maximum extent practicable. It is expected that the State of Florida will exercise its authority and responsibility, regarding beach nourishment, to the full extent during any future permitting activities. Beneficial use of beach compatible dredged material for beach nourishment is strongly encouraged and supported by EPA.

2.4.4 Dredge Material Quality Verification. The suitability of dredged material for ocean disposal must be verified by the USACE and agreed to via written concurrence from EPA prior to disposal. Verification will be valid for three years from the most current verification.

Verification process:

1) Case-specific evaluation against the exclusion criteria (40 CFR 227.13(b))
2) Determination of testing requirements for non-excluded material based on the potential of sediment contamination since last verification.
3) When applicable, execute testing and determination of suitability of non-excluded material for ocean disposal.

Verification documentation for suitability will be completed prior to use of the Port Everglades Harbor ODMDS. Documentation will be in the form of a MPRSA Section 103 Evaluation. Potential testing and the Evaluation will follow the procedures outlined in the 1991 EPA/USACE Dredged Material Testing Manual and 2008 Southeast Regional Implementation Manual (SERIM) or the appropriate updated versions. This includes how dredging projects will be subdivided into project segments for sampling and analysis. The MPRSA Section 103 Evaluation will be in the form outlined in Appendix C of the SERIM. Water Quality Compliance determinations will be made using the STFATE (ADDAMS) model and the input parameters provided in Appendix A of this document. Only material determined to be suitable through the verification process by the USACE and EPA, Region 4 will be placed at the Port Everglades Harbor ODMDS.

2.5 Time of disposal. At present no restrictions have been determined to be necessary for disposal related to seasonal variations in ocean current or biotic activity. As monitoring results are compiled, should any such restrictions appear necessary, disposal activities will be scheduled so as to avoid adverse impacts. Additionally, if new information indicates that endangered or threatened species are being adversely impacted, restrictions may be incurred.

2.6 Disposal Technique. No specific disposal technique is required for this site. Disposal shall be initiated within the specified disposal release zone and shall be completed (doors closed) prior to departing the ODMDS. While in route to the ODMDS, the disposal vessel must remain within the navigation channel while west of the buoy G"3". Standard surveillance and evasive measures to protect sea turtles and marine mammals shall be employed during all disposal operations at the Port Everglades Harbor ODMDS.

2.7 Disposal Location. 40 CFR §227.28 requires that disposal occur no less than 330 feet (100 meters) inside the designated site boundaries. Release zones have been established to satisfy this criterion as well as manage dredged material disposal. The release zone is described below in Table 2 and shown in Figure 2.

**Table 2. Port Everglades Harbor ODMDS Disposal Release Zone**

| Vertices | Geographic NAD 83 | | State Plane (Florida East 0901 U.S. Ft) NAD 83 | |
|---|---|---|---|---|
| | Latitude (North) | Longitude (West) | Easting | Northing |
| NW | 26° 07.9000'N | 80° 02.0000'W | 973,282 | 654,703 |
| NE | 26° 07.9000'N | 80° 01.8333'W | 974,264 | 654,711 |
| SW | 26° 07.4000'N | 80° 02.0000'W | 973,304 | 651,733 |
| SE | 26° 07.4000'N | 80° 01.8333'W | 974,286 | 651,740 |

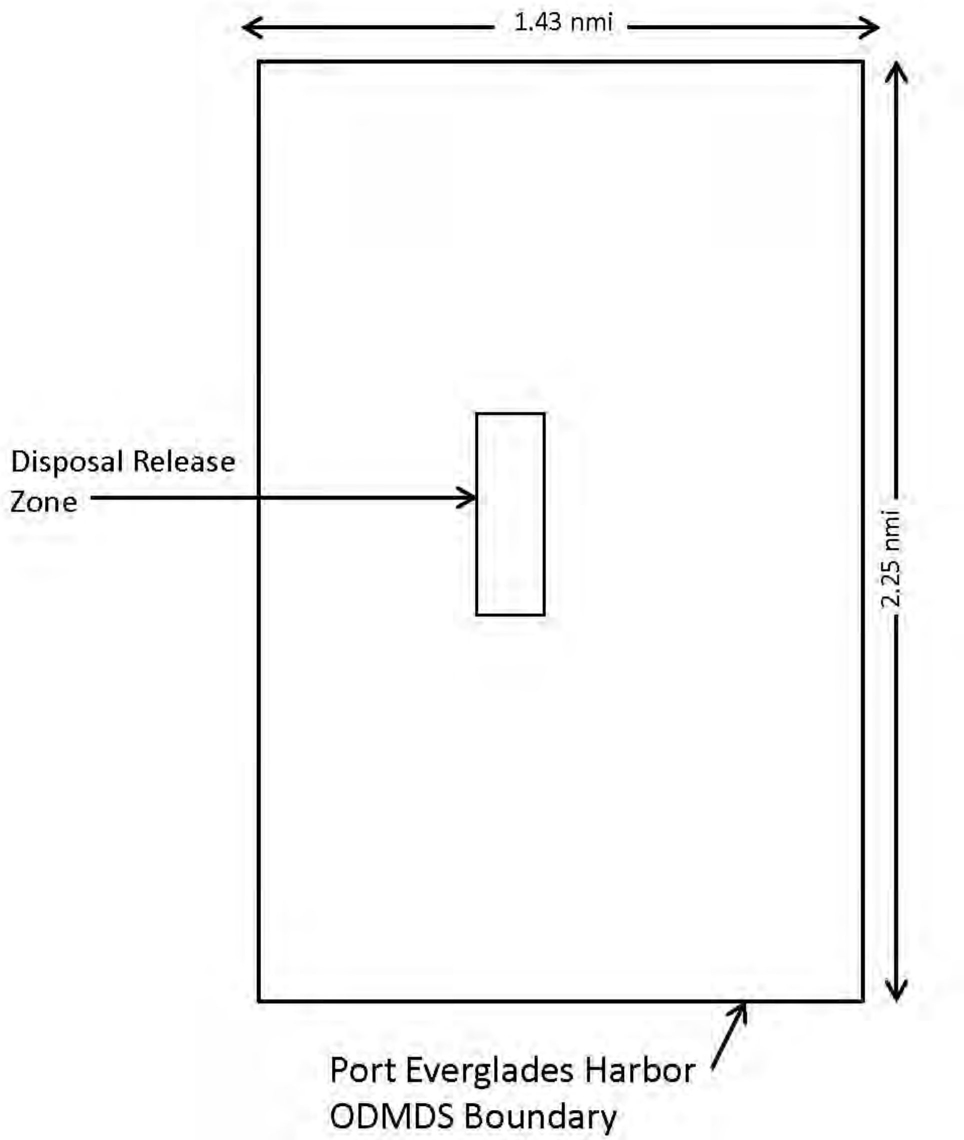


**Figure 2. Port Everglades ODMDS Disposal Release Zone**

2.8 Permit and Contract Conditions. The disposal monitoring and post-disposal monitoring requirements described under Site Monitoring will be included as permit conditions on all MPRSA Section 103 permits and will be incorporated in the contract language for all federal projects.  A summary of the management and monitoring requirements to be included are listed in Table 3.  Template language that can be used is included in appendices (see Appendix B and C).

**Table 3. Summary of Permit and Contract Conditions**

| Condition | Reference |
|---|---|
| Dredged Material Suitability and Term of Verification | Port Everglades Harbor ODMDS SMMP page 6, Southeast Regional Implementation Manual |
| Disposal within Appropriate Zone | Port Everglades Harbor ODMDS SMMP page 7-8 |
| Post Bathymetric Surveys within 30 days of Project Completion | Port Everglades Harbor ODMDS SMMP page 15 |
| Disposal Monitoring and Recording of Disposal Locations | Port Everglades Harbor ODMDS SMMP page 14-15 |
| Reporting Requirements: Disposal Summary Reports within 90 Days of Project Completion | Port Everglades Harbor ODMDS SMMP page 20 |

2.9 Permit Process. All disposal of dredged material in the ocean, with the exception of Federal Civil Works projects, requires an ocean dumping permit issued by the USACE pursuant to Section 103 of the MPRSA. A summary of the permitting process can be found at: http://www.epa.gov/region4/water/oceans/Dredged_Material_Permit_Process.htm.

2.10 Information Management of Dredged Material Placement Activities. As discussed in the following sections, a substantial amount of diverse data regarding use of the Port Everglades Harbor ODMDS and effects of disposal is required from many sources. If this information is readily available and in a useable format it can be used to answer many questions typically asked about a disposal site:

- What is being dredged?
- How much is being dredged?
- Where did the dredged material come from?
- Where was the dredged material placed?
- Was dredged material dredged and disposed correctly?
- What will happen to the environment at the disposal site?

In an attempt to streamline data sharing, EPA Region 4 and USACE South Atlantic Division have agreed on an eXtensible Markup Language (XML) standard for sharing of disposal monitoring data (see also Section 3.5). Additional standards will continue to be investigated for sharing of other disposal site related information (e.g. environmental monitoring data, testing data, etc.).

## 3.0 SITE MONITORING

The MPRSA establishes the need for including a monitoring program as part of the Site Management Plan. Site monitoring is conducted to ensure the environmental integrity of a disposal site and the areas surrounding the site and to verify compliance with the site designation criteria, any special management conditions, and with permit requirements. Monitoring programs should be flexible, cost effective, and based on scientifically sound procedures and methods to meet site-specific monitoring needs. The intent of the program is to provide the following:

(1) Information indicating whether the disposal activities are occurring in compliance with the permit and site restrictions;

(2) Information indicating the short-term and long-term fate of materials disposed of in the marine environment.

(3) Information concerning the short-term and long-term environmental impacts of the disposal;

The main purpose of a disposal site monitoring program is to determine whether dredged material site management practices, including disposal operations, at the site need to be changed to avoid significant adverse impacts.

3.1 Baseline Monitoring. Site characterization surveys of the ODMDS were conducted by EPA and the USACE as part of the designation process. Results from these surveys can be used in part as baseline data for the monitoring of impacts associated with use of the Port Everglades Harbor ODMDS. The results of investigations presented in the designation FEIS (EPA 2004) and the Environmental Assessment for the Expansion of the Port Everglades ODMDS (EPA, in press) and subsequent surveys are listed in Table 4 will serve as the main body of data for the monitoring of the impacts associated with the use of the Port Everglades Harbor ODMDS.

**Table 4. Surveys and Studies Conducted at the Port Everglades Harbor ODMDS**

| Survey/Study Title | Conducted By: | Date | Purpose | Results |
|---|---|---|---|---|
| *Benthic Macroinfaunal Analysis of the Port Everglades and Palm Beach, Florida ODMDS Surveys* | Battell for U.S. EPA Region 4 | 1984 | Characterization Survey (sediment analysis, benthic biota) | Characterization of benthos for February & November 1984 |
| *Field Studies in Nearshore Areas at Port Everglades, Palm Beach County, and Brevard County, Florida* | Continental Shelf Associates for U.S. EPA Region 4 | 1986 | Benthic characterization of one square mile candidate site (4 mile candidate site) through sidescan and bathymetry. | No high relief ledges, rock outcrops or steep slopes detected. Occasional rubble or cobbles and some low relief rock outcrop. |
| *Video, Still Camera, and Side Scan Sonar Survey of the Seafloor Within and Downcurrent of a Tentative Alternative ODMDS off Port Everglades, Florida* | Continental Shelf Associates for U.S. EPA Region 4 | 1986 | Look for presence of natural resources (critical habitat) and presence of manmade obstruction on the bottom and down current of site. | Data showed a predominately fine-to-course sediment covered bottom with scattered rocks, areas of rock rubble and sand ripples. |
| *Sediment & Water Quality of Candidate Ocean Dredged Material Disposal Sites for Port Everglades and Palm Beach, Florida* | U.S. EPA Region 4 | 1999 | Characterization Survey (water column profiles, water quality, sediment characteristics, benthic bioata) | Conditions at the site are relatively pristine. Water column is clear with low suspended sediment concentrations (2-20mg/l). Sediments consists of mostly fine sand (70%) and have low level of contaminants. |
| *Sidescan Survey of Candidate Ocean Dredged Material Disposal Sites for Port Evergades and Palm Beach, Florida* | U.S. EPA Region 4 | 1999 | Look for presence of natural resources (critical habitats) and presence of manmade obstructions on the bottom. | The side-scan sonar data indicated a fine sandy bottom with scattered rubble zones throughout the site and areas 2 miles to the north and 2 miles south of the site. No areas of rock outcrops or potential wrecks were identified through the side-scan record within the site or north or south of the site. |

**Table 4. Surveys and Studies Conducted at the Port Everglades Harbor ODMDS**

| Survey/Study Title | Conducted By: | Date | Purpose | Results |
|---|---|---|---|---|
| *Pre Disposal Bathymetry* | USACE | July 2005 | Pre-disposal survey | |
| *Post Disposal Bathymetry* | USACE | December 2005 | Post-disposal survey | No changes were observable from the pre disposal survey. |
| *Rapid Seafloor Reconnaissance and Assessment of Southeast Florida Ocean Dredged Material Disposal Sites Utilizing Sediment Profile Imaging – Post Disposal SPI Mapping at the Port Everglades ODMDS* | Germano & Associates for U.S. EPA Region 4 | May 2006 | Map the spatial distribution of disposed dredged material on the seafloor, characterize physical changes in the seafloor resulting from disposal, and evaluate the extent of benthic infaunal recolonization through the mapping of infaunal successional stages. | Dredged material formed an elliptical deposit on the seafloor with the upper half of the elliptical deposit occurring to the north of the disposal site. The main physical change resulting from disposal appeared to be a subtle shift in sediment texture, Overall, at the majority of stations within the dredged material footprint and in surrounding areas, it did not appear that there had been any adverse changes in oxygen demand, redox state, or other geochemical properties as a result of disposal. Local benthic communities are rapidly recolonizing the sandy dredged material that had been deposited at the Port Everglades Harbor ODMDS and are at an intermediate stage of recolonization. The release zone was moved in 2009 to keep future disposal deposits within the ODMDS boundaries. |
| *Site Expansion Preliminary Characterization Study* | EPA Region 4 / Water & Air Research / ANAMAR | October 2007 | Characterize the grain size, chemistry, and biology of the benthos and the physiochemical properties of the water column for future potential site expansion. | Water column is well mixed over the upper 70 meters. Photic zone extends to 55 meters. DO is low (<5mg/l) below 140 meters. No chemicals were found above federal WQC. Sediments ranged from sandy silt to silty sand. Organic tins, metals and PAHs were detected at low levels in the sediments. |

**Table 4. Surveys and Studies Conducted at the Port Everglades Harbor ODMDS**

| Survey/Study Title | Conducted By: | Date | Purpose | Results |
|---|---|---|---|---|
| *Site Designation Study for the Port Everglades Harbor Ocean Dredged Material Disposal Site Expansion* | ANAMAR Environmental Consulting for USACE | May 2011 | Characterization survey (water column profiles, water quality, sediment characteristics, benthic bioata) | Water column is well mixed over the upper 20 meters. Photic zone extends to 65 meters. DO is low (<5mg/l) below 100 meters. Total suspended solids ranged from 6 to 13 mg/l. Sediments were silty/clayey med/fine sand. Sediments in the expansion area had lower levels of metals, organic tins, PAHs, pesticides and PAHs than the single station within the ODMDS. |
| *Pre Disposal SPI Mapping for the Port Everglades Harbor Ocean Dredged Material Disposal Site Expansion* | EPA Region 4 | May 2011 | Baseline SPI data for future SPI surveys and to photograph areas identified as having potential for hard bottom habitats. | The sediment profile images have not been analyzed. The planview images showed 3-4 stations with exposed hard bottom in an area north of the existing ODMDS within the expansion area. |
| *Pre Disposal Bathymetry* | USACE | Feb 2012 | Pre-disposal survey | |
| | | | | |

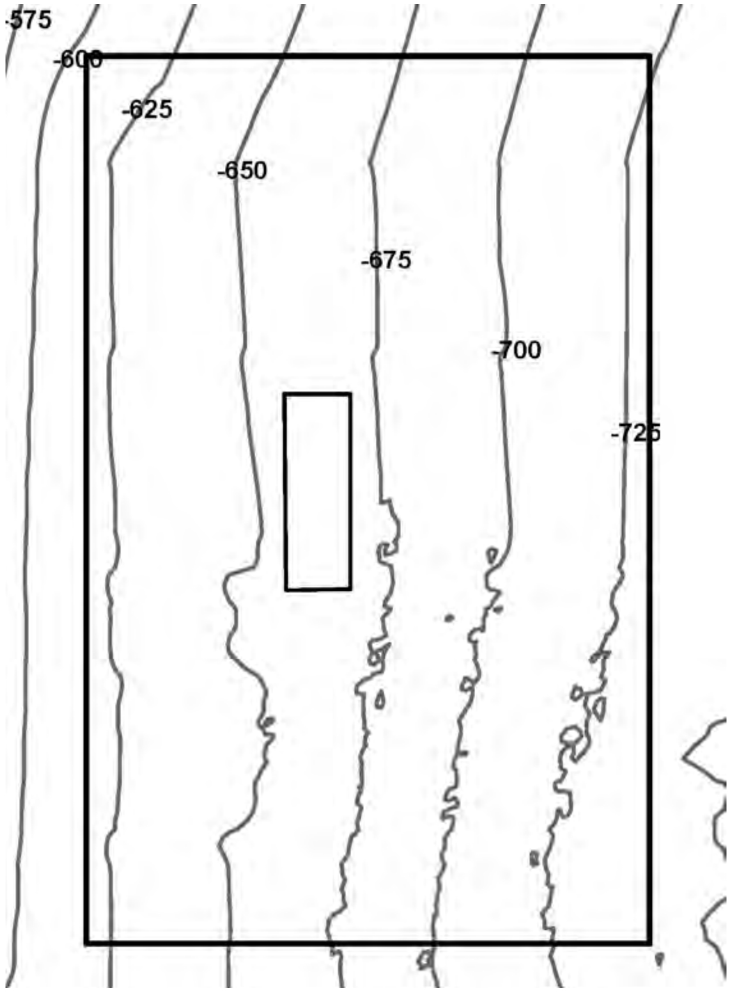


**Figure 3. Port Everglades Harbor ODMDS October 2012 Bathymetry**

<u>3.2 Disposal Monitoring</u>. For all disposal activities, an electronic tracking system (ETS) must be utilized. The ETS will provide surveillance of the transportation and disposal of dredged material. The ETS will be maintained and operated to continuously track the horizontal location and draft condition (nearest 0.5 foot) of the disposal vessel (i.e. hopper dredge or disposal scow) from the point of dredging to the disposal site and return to the point of dredging. Data shall be collected at least every 500 feet during travel to and from the ODMDS and every minute or every 200 feet of travel, whichever is smaller, while approaching within 1,000 feet of the ODMDS and within the ODMDS. In addition to the continuous tracking data, the following trip information shall be electronically recorded for each disposal cycle:

a. Load Number
b. Disposal Vessel Name and Type (e.g. scow)
c. Estimated volume of Load
d. Description of Material Disposed
e. Source of Dredged Material
f. Date, Time and Location at Start at Initiation and Completion of Disposal Event

It is expected that disposal monitoring will be conducted utilizing the Dredge Quality Management (DQM) system for Civil Works projects [see http://dqm.usace.army.mil/Specifications/Index.aspx], although other systems are acceptable. Disposal monitoring and ETS data will be reported to EPA Region 4 on a weekly basis utilizing the eXtensible Markup Language (XML) specification and protocol per Section 3.5. EPA Region 4 and the USACE District shall be notified within 24 hours if disposal occurs outside of the ODMDS or specified disposal zone or if excessive leakage occurs.

3.3 Post Discharge Monitoring. The USACE or other site user will conduct a bathymetric survey within 30 days after disposal project completion. Surveys will not be required for projects less than 50,000 cubic yards. Bathymetric surveys will be used to monitor the disposal mound to insure a navigation hazard is not produced, to assist in verification of material placement, to monitor bathymetry changes and trends and to insure that the site capacity is not exceeded, i.e., the mound does not exceed the site boundaries. Surveys will conform to the minimum performance standards for Corps of Engineers Hydrographic Surveys for "Other General Surveys & Studies" as described in the USACE Engineering Manual, EM1110-2-1003, *Hydrographic Surveying* dated January 1, 2002 [http://140.194.76.129/publications/eng-manuals/em1110-2-1003/toc.htm]. The number and length of transects required will be sufficient to encompass the release zone utilized and a 500 foot wide area around it. The surveys will be taken along lines spaced at 500-foot intervals or less. The minimum performance standards from table 3-1 *Hydrographic Surveying* shall be followed. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing a differential global positioning system. The vertical datum will be referenced to prescribed NOAA Mean Lower Low Water (MLLW) datum. The horizontal datum should be referenced to the local State Plane Coordinate System (SPCS) for that area or in Geographical Coordinates (latitude-longitude). The horizontal reference datum should be the North American Datum of 1983 (NAD 83).

3.4 Material Tracking and Disposal Effects Monitoring. Surveys can be used to address possible changes in bathymetric, sedimentological, chemical, and biological aspects of the ODMDS and surrounding area as a result of the disposal of dredged material at the site.

3.4.1 Summary of Results of Past Monitoring Surveys

Surveys conducted at the Port Everglades Harbor ODMDS are listed in Table 4. Two disposal events have occurred since site designation. After the first event, no measurable change in bathymetry was detectable. A post disposal benthic assessment using Sediment Profile Imaging (SPI) showed that dredged material disposal formed an elliptical deposit on the seafloor within the northern portion and extending north of the original ODMDS. This resulted in a shift to a slightly sandier substrate at the ODMDS. There was no indication of any adverse changes in oxygen demand, redox state, or other geochemical properties as a result of disposal. Results suggested that while benthic communities over the dredged material deposit were rapidly approaching those on the ambient seafloor relatively soon after disposal, this process was still ongoing at the time of the survey and not yet complete. Limited sampling conducted as part of the site expansion survey in 2011 indicated that concentrations of metals, organic tins, PAHs, PCBs and pesticides within the original ODMDS are above background levels and some are above some sediment quality guidelines. However, they remain below levels found in the dredged material approved for ocean disposal and therefore no adverse effects are expected.

### 3.4.2 Future Monitoring Surveys

Based on the type and volume of material disposed and impacts of concern, various monitoring surveys can be used to examine if and the direction the disposed dredged material is moving, and what environmental effect the material is having on the site and adjacent areas.

At the current time, no nearby biological resources have been identified that are of concern for potential impact. Changes in sediment composition will likely alter the benthic community structure. However, based on previous benthic studies, it is unlikely that permanent or long-term adverse impacts will result due to changes in sediment composition.
A Trend Assessment study is planned for 2014 as well as an SPI study to evaluate the effectiveness of the new release zone on maintaining material within the ODMDS.

**Table 5. Port Everglades Harbor ODMDS Monitoring Strategies and Thresholds for Action**

| Goal | Technique | Sponsor | Rationale | Frequency | Threshold for Action | Management Options | |
|---|---|---|---|---|---|---|---|
| | | | | | | Threshold Not Exceeded | Threshold Exceeded |
| Trend Assessment | Water and Sediment Quality, Benthic Community Analysis (40CFR228.13) | U.S. EPA | Periodically evaluate the impact of disposal on the marine environment (40CFR 228.9) | Approximately every 10 years. | -Absence from the site of pollution sensitive biota<br>-Progressive non-seasonal changes in water or sediment quality | Continue Monitoring | -Conduct Environmental Effects Monitoring or Advanced Environmental Effects Monitoring<br>-Review dredged material evaluation procedures |
| Environmental Effects Monitoring | Chemical Monitoring | EPA/ USACE | Determine if chemical contaminants are significantly elevated[1] within and outside of site boundaries | Implement if disposal footprint extends beyond the site boundaries or if Trend Assessment results warrant. | Contaminants are found to be elevated | Discontinue monitoring. | - Institute Advanced Environmental Effects Monitoring<br>- Implement case specific management options (ie. Remediation, limits on quantities or types of material).<br>-Consider isolating dredged material (capping) |
| | Benthic Monitoring | EPA/ USACE | Determine whether there are adverse changes in the benthic populations outside of the site and evaluate recovery rates | | Adverse changes observed outside of the site that may endanger the marine environment | | |

| Goal | Technique | Sponsor | Rationale | Frequency | Threshold for Action | Management Options | |
|---|---|---|---|---|---|---|---|
| | | | | | | Threshold Not Exceeded | Threshold Exceeded |
| [1] Significantly elevated: Concentrations above the range of contaminant levels in dredged sediments that the Regional Administrator and the District Engineer found to be suitable for disposal at the ODMDS.<br>[2] Examples of sub-lethal effects include without limitation the development of lesions, tumors, development abnormality, and/or decreased fecundity. | | | | | | | |
| Advanced Environmental Effects Monitoring | Tissue Chemical Analysis | EPA/ USACE | Determine if the site is a source of adverse bioaccumulation which may endanger the marine environment | Implement if Environmental Effects Monitoring warrants. | Benthic body burdens and risk assessment models indicate potential for food chain impacts. | Discontinue monitoring | -Discontinue site use<br>- Implement case specific management options (i.e. Remediation, limits on quantities or types of material). |
| | Benthic Monitoring | | Determine if the site is a source of adverse sub-lethal[2] changes in benthic organisms which may endanger the marine environment | | Sub-lethal effects are unacceptable. | | |
| Monitor Bathymetric Trends | Bathymetry | User | Determine the extent of the disposal mound and major bathymetric changes | Pre and post disposal for significant projects (>50,000cy) | Disposal mound occurs outside ODMDS boundaries | Continue Monitoring | -Modify disposal method/placement<br>-Restrict disposal volumes<br>-Enlarge site |

| Goal | Technique | Sponsor | Rationale | Frequency | Threshold for Action | Management Options | |
|---|---|---|---|---|---|---|---|
| | | | | | | Threshold Not Exceeded | Threshold Exceeded |
| Short and Long-term Fate of Disposed Dredged Material | Sediment Profile Imaging | User/ EPA | Confirm aerial extent of disposal mound and benthic impact. | Following change in release zone and major new work projects | Measurable deposition (>5cm) outside of site boundaries | -Continue site use without restrictions | -Increase buffer as needed.<br>-Restrict disposal volumes.<br>-Create sand berms to retard dredged material transport. |
| Compliance | Disposal Site Use Records in EPA Region 4's XML format | Site User | -Insure management requirements are being met<br>-To assist in site monitoring | Weekly during the project | Disposal records required by SMMP are not submitted or are incomplete | Continue Monitoring | -Restrict site use until requirements are met |

3.5 Reporting and Data Formatting.

3.5.1 Project Initiation and Violation Reporting. The USACE or other site user shall notify EPA 15 days prior to the beginning of a dredging cycle or project disposal. The user is also required to notify the USACE and the EPA within 24 hours if a violation of the permit and/or contract conditions related to MPRSA Section 103 or SMMP requirements occur during disposal operations.

3.5.2 Disposal Monitoring Data. Disposal monitoring data shall be provided to EPA Region 4 electronically on a weekly basis. Data shall be provided per the EPA Region 4 XML format and delivered as an attachment to an email to DisposalData.R4@epa.gov. The XML format is available from EPA Region 4.

3.5.3 Post Disposal Summary Reports. A Post Disposal Summary Report shall be provided to EPA within 90 days after project completion. These reports should include: dredging project title; permit number and expiration date (if applicable); contract number; name of contractor(s) conducting the work, name and type of vessel(s) disposing material in the ODMDS; disposal timeframes for each vessel; volume disposed at the ODMDS (as paid *in situ* volume, total paid and un paid *in situ* volume, and gross volume reported by dredging contractor), number of loads to ODMDS, type of material disposed at the ODMDS; identification by load number of any misplaced material; dates of pre and post disposal bathymetric surveys of the ODMDS and a narrative discussing any violation(s) of the 103 concurrency and/or permit (if applicable). The narrative should include a description of the violation, indicate the time it occurred and when it was reported to the EPA and USACE, discuss the circumstances surrounding the violation, and identify specific measures taken to prevent reoccurrence. The Post Disposal Summary Report should be accompanied by the bathymetry survey results (plot and X,Y,Z ASCII data file), a summary scatter plot of all disposal start locations, and a summary table of the trip information required by Section 3.2 with the exception of the disposal completion data. If all data is provided in the required XML format, scatter plots and summary tables will not be necessary.

3.5.4 Environmental Monitoring. Material tracking, disposal effects monitoring, and any other data collected shall be coordinated with and be provided to SMMP team members and federal and state agencies as appropriate. Data will be provided to other interested parties requesting such data to the extent possible. Data will be provided for all surveys in a report generated by the action agency.

The report should indicate:

1) How the survey relates to the SMMP and previous surveys at the Port Everglades Harbor ODMDS
2) Provide data interpretations, conclusions, and recommendations
3) Project the next phase of the SMMP

Monitoring results will be summarized in subsequent revisions to the SMMP.

## 4.0 MODIFICATION OF THE PORT EVERGLADES HARBOR ODMDS SMMP

Should the results of the monitoring surveys or reports from other sources indicate that continued use of the ODMDS would lead to unacceptable effects as determined by EPA and USACE; the ODMDS SMMP will be modified to mitigate the adverse impacts. The SMMP will be reviewed and revised at a minimum of every ten years. The SMMP will be reviewed and updated as necessary if site use changes significantly. For example, the SMMP will be reviewed if the quantity or type of dredged material placed at the site changes significantly or if conditions at the site indicate a need for revision.

## 5.0 REFERENCES

U.S. Army Corps of Engineers (USACE). 2002. *Engineering & Design - Hydrographic Surveying*. Engineering Manual 1110-2-1003, Department of the Army, Washington D.C.

U.S. Environmental Protection Agency (EPA). In press. *Environmental Assessment on Expansion of the Port Everglades Ocean Dredged Material Site (ODMDS).*

U.S. Environmental Protection Agency (EPA). 2004. *Final Environmental Impact Statement (EIS) for Designation of the Palm Beach Harbor Ocean Dredged Material Disposal Site and the Port Everglades Harbor Ocean Dredged Material Disposal Site,* July 2004.

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, 1991. *Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual)*, February 1991. Prepared by Environmental Protection Agency Office of Marine and Estuarine Protection and Department of Army United States Army Corps of Engineers under EPA Contract No. 68-C8-0105.

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, 1996. *Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites*, February 1996. Prepared by Environmental Protection Agency Office of Water and Department of Army United States Army Corps of Engineers.

U.S. Environmental Protection Agency, Region 4 and U.S. Army Corps of Engineers, South Atlantic Division, 2007. *Memorandum of Understanding Between U.S. Army Corps of Engineers, South Atlantic Division and U.S. Environmental Protection Agency, Region, 4 on Ocean Dredged Material Disposal*, April 2007.

U.S. Environmental Protection Agency, Region 4 and U.S. Army Corps of Engineers, South Atlantic Division, 2008. *Southeast Regional Implementation Manual (SERIM) Requirements and Procedures for Evaluation of the Ocean Disposal of Dredged Material in Southeastern Atlantic and Gulf Coastal Waters*, August 2008.

# APPENDIX A

# WATER COLUMN EVALUATIONS NUMERICAL MODEL (STFATE) INPUT PARAMETERS

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Water Column Evaluations
Numerical Model (STFATE) Input Parameters
Port Everglades Harbor ODMDS

**SITE DESCRIPTION**

| Parameter | Value | Units |
|---|---|---|
| Number of Grid Points (left to right) | 40 | |
| Number of Grid Points (top to bottom) | 60 | |
| Spacing Between Grid Points (left to right) | 400 | ft |
| Spacing Between Grid Points (top to bottom) | 400 | ft |
| Constant Water Depth | 645 | ft |
| Roughness Height at Bottom of Disposal Site | .005[1] | ft |
| Slope of Bottom in X-Direction | 0 | Deg. |
| Slope of Bottom in Z-Direction | 1.0 | Deg. |
| Number of Points in Ambient Density Profile Point[2] | 5 | |
| Ambient Density at Depth = 0 ft | 1.0237 | g/cc |
| Ambient Density at Depth = 65 ft | 1.0238 | g/cc |
| Ambient Density at Depth = 164 ft | 1.0246 | g/cc |
| Ambient Density at Depth = 328 ft | 1.0272 | g/cc |
| Ambient Density at Depth = 645 ft | 1.0282 | g/cc |

**AMBIENT VELOCITY DATA[3]**

| Parameter | Value | Units |
|---|---|---|
| Profile | 2-Point at constant depth | |
| X-Direction Velocity = 8 feet | -2.7 | ft/sec |
| Z-Direction Velocity = 8 feet | 1.1 | ft/sec |
| X-Direction Velocity = 38 feet | -2.2 | ft/sec |
| Z-Direction Velocity = 38 feet | 0.9 | ft/sec |

**DISPOSAL OPERATION DATA**

| Parameter | Value | Units |
|---|---|---|
| Location of Disposal Point from Top of Grid | 13,307 | ft |
| Location of Disposal Point from Left Edge of Grid | 7,078 | ft |
| Dumping Over Depression | 0 | |

### INPUT, EXECUTION AND OUTPUT

| Parameter | Value | Units |
|---|---|---|
| Location of the Upper Left Corner of the Disposal Site - Distance from Top Edge | 6636 | ft |
| Location of the Upper Left Corner of the Disposal Site - Distance from Left Edge | 3461 | ft |
| Location of the Lower Right Corner of the Disposal Site - Distance from Top Edge | 20282 | ft |
| Location of the Lower Right Corner of the Disposal Site - Distance from Left Edge | 12139 | ft |
| Duration of Simulation | 14,400 | sec |
| Long Term Time Step | 600 | sec |

### COEFFICIENTS

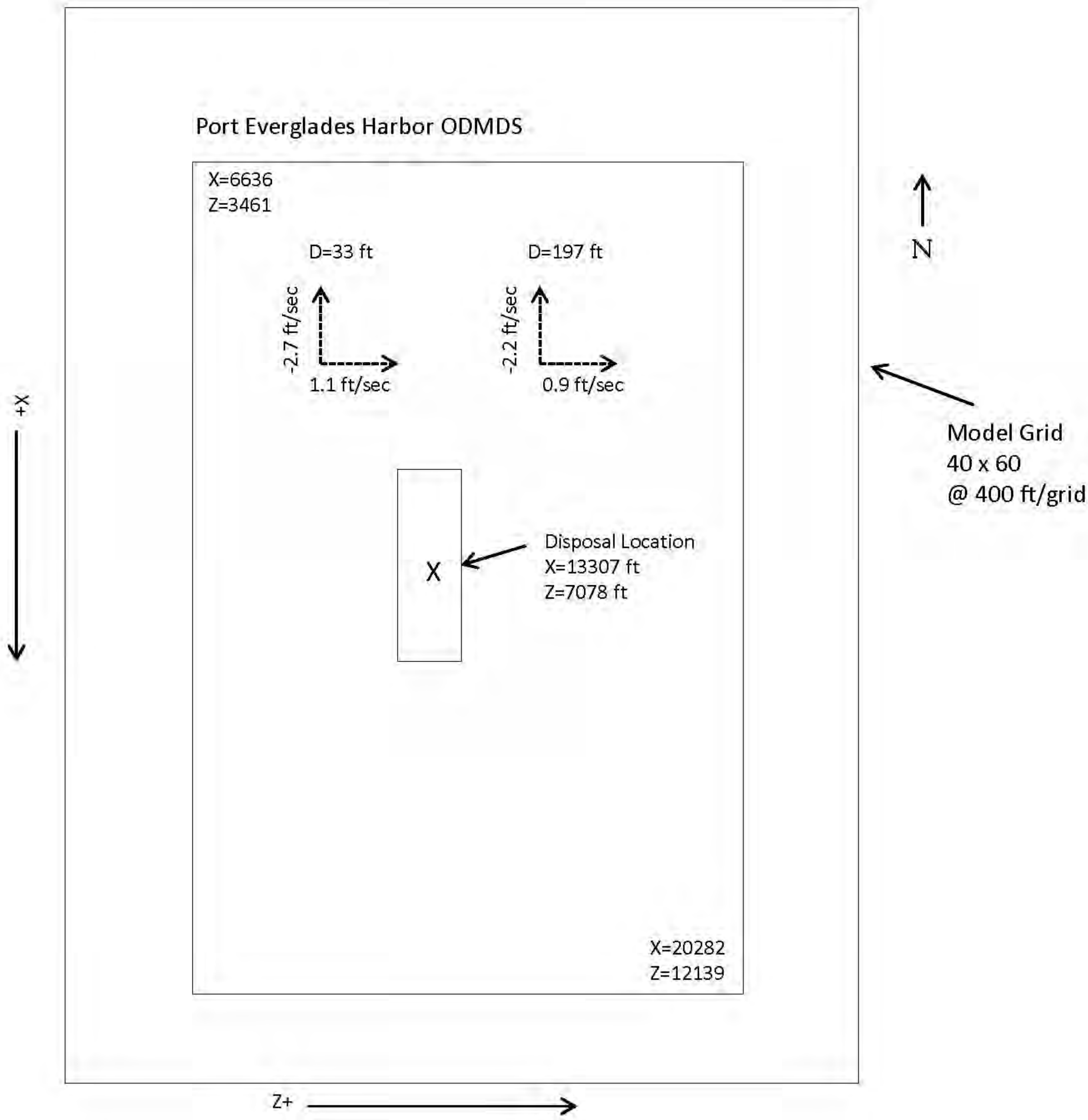
| Parameter | Keyword | Value |
|---|---|---|
| Settling Coefficient | BETA | 0.000[1] |
| Apparant Mass Coefficient | CM | 1.000[1] |
| Drag Coefficient | CD | 0.500[1] |
| Form Drag for Collapsing Cloud | CDRAG | 1.000[1] |
| Skin Friction for Collapsing Cloud | CFRIC | 0.010[1] |
| Drag for an Ellipsoidal Wedge | CD3 | 0.100[1] |
| Drag for a Plate | CD4 | 1.000[1] |
| Friction Between Cloud and Bottom | FRICTN | 0.010[1] |
| 4/3 Law Horizontal Diffusion Dissipation Factor | ALAMDA | 0.001[1] |
| Unstratified Water Vertical Diffusion Coefficient | AKYO | Pritchard Expression |
| Cloud/Ambient Density Gradient Ratio | GAMA | 0.250[1] |
| Turbulent Thermal Entrainment | ALPHAO | 0.39[4] |
| Entrainment in Collapse | ALPHAC | 0.100[1] |
| Stripping Factor | CSTRIP | 0.003[1] |

[1] Model Default Value

[2] Profile from EPA 2011 measurements (ANAMAR 2012)

[3] Velocity data represents average conditions. Determined from WES 1998 analysis of ADCP data offshore Ft. Lauderdale, FL.

[4] Calculated from NOAA Field Work at Miami (1991)


Port Everglades Harbor ODMDS
X=6636
Z=3461
D=33 ft
-2.7 ft/sec
1.1 ft/sec
D=197 ft
-2.2 ft/sec
0.9 ft/sec
N
Model Grid
40 x 60
@ 400 ft/grid
+X
X
Disposal Location
X=13307 ft
Z=7078 ft
X=20282
Z=12139
Z+

**Port Everglades Harbor ODMDS Background Water Concentration.**

| Chemicals of Concern | Background Concentration Levels (µg/l) |
|---|---|
| Arsenic | 1.54 [1] |
| Cadmium | 0.021 [1] |
| Chromium (VI) | 0.15 [1] |
| Copper | 0.16 [1] |
| Lead | 0.012 [1] |
| Mercury | 0.1[,1,2] |
| Nickel | 0.25 [1] |
| Selenium | 0.5 [1,2] |
| Silver | 0.01[1,2] |
| Zinc | 0.88[1] |
| Cyanide | 1.0 [1,2] |
| Tributyltin (TBT) | 0.025 [1,2] |
| Aldrin | 0.0043 [1,2] |
| Chlordane | 0.1 [1,2] |
| DDT | 0.0017 [1] |
| Dieldrin | 0.0043 [1,2] |
| alpha - Endosulfan | 0.0043 [1,2] |
| beta - Endosulfan | 0.0043 [1,2] |
| Endrin | 0.0043 [1,2] |
| gamma-BHC (Lindane) | 0.0043 [1,2] |
| Heptachlor | 0.0043 [1,2] |
| Heptachlor Epoxide | 0.0043 [1,2] |
| Toxaphene | .24 [1,2] |
| Pentachlorophenol | 0.47 [1,2] |

[1] Samples collected by EPA, Region 4, October 2007 at the Port Everglades ODMDS (USACE 2010) – Values taken from near bottom samples.
[2] Analyte not detected. Value based on one half the reporting limit.

APPENDIX B

TEMPLATE
GENERIC SPECIAL CONDITIONS
FOR MPRSA SECTION 103 PERMITS
PORT EVERGLADES HARBOR, FL ODMDS

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GENERIC SPECIAL CONDITIONS
FOR MPRSA SECTION 103 PERMITS

I. DISPOSAL OPERATIONS

A. For this permit, the term disposal operations shall mean: navigation of any vessel used in disposal of operations, transportation of dredged material from the dredging site to the Port Everglades Harbor ODMDS, proper disposal of dredged material at the disposal area within the Port Everglades Harbor ODMDS, and transportation of the hopper dredge or disposal barge or scow back to the dredging site.

B. The Port Everglades Harbor ODMDS is defined as the rectangle with center coordinates of 26°07.625'N latitude and 80°01.784'W longitude (NAD 83) or state plane coordinates 653067.2 ft N and 974516.7 ft E (NAD83). The site coordinates are as follows:

| | Geographic NAD 83 | | State Plane (Florida East 0901 U.S. Ft) NAD 83 | |
|---|---|---|---|---|
| | Latitude (North) | Longitude (West) | Easting | Northing |
| NE | 26°08.746'N | 80°00.981'W | 978,855.7 E | 659,889.0 N |
| NW | 26°08.756'N | 80°02.568'W | 970,178.0 E | 659,889.0 N |
| SW | 26°06.504'N | 80°02.587'W | 970,178.0 E | 646,242.9 N |
| SE | 26°06.493'N | 80°01.000'W | 978,855.7 E | 646,242.9 N |

C. No more than [NUMBER] cubic yards of dredged material excavated at the location defined in [REFERENCE LOCATION IN PERMIT] are authorized for disposal at the Port Everglades Harbor ODMDS.

D. The permittee shall use an electronic positioning system to navigate to and from the Port Everglades Harbor ODMDS. For this section of the permit, the electronic positioning system is defined as: a differential global positioning system or a microwave line of site system. Use of LORAN-C alone is not an acceptable electronic positioning system for disposal operations at the Port Everglades Harbor ODMDS. If the electronic positioning system fails or navigation problems are detected, all disposal operations shall cease until the failure or navigation problems are corrected.

E. The permittee shall certify the accuracy of the electronic positioning system proposed for use during disposal operations at the Port Everglades Harbor ODMDS. The certification shall be accomplished by direct comparison of the electronic positioning system's accuracy with a known fixed point.

F. The permittee shall not allow any water or dredged material placed in a hopper dredge or disposal barge or scow to flow over the sides or leak from such vessels during transportation to the Port Everglades Harbor ODMDS.

G. A disposal operations inspector and/or captain of any tug boat, hopper dredge or other vessel used to transport dredged material to the Port Everglades Harbor ODMDS shall insure compliance with disposal operation conditions defined in this permit.

1. If the disposal operations inspector or the captain detects a violation, he shall report the violation to the permittee immediately.

2. The permittee shall contact the U.S. Army Corps of Engineers, Jacksonville District's Regulatory Division [TELEPHONE NUMBER] and EPA Region 4 at (404) 562-9391 to report the violation within twenty-four (24) hours after the violation occurs. A complete written explanation of any permit violation shall be included in the disposal summary report.

H. When dredged material is disposed, no portion of the hopper dredge or disposal barge or scow shall be outside of the boundaries of the Port Everglades Harbor ODMDS as defined in Special Condition B. Additionally, disposal shall be initiated within the disposal release zone defined by the following coordinates:

| Vertices | Geographic NAD 83 | | State Plane (Florida East 0901 U.S. Ft) NAD 83 | |
|---|---|---|---|---|
| | Latitude (North) | Longitude (West) | Easting | Northing |
| NW | 26° 07.9000'N | 80° 02.0000'W | 973,282 | 654,703 |
| NE | 26° 07.9000'N | 80° 01.8333'W | 974,264 | 654,711 |
| SW | 26° 07.4000'N | 80° 02.0000'W | 973,304 | 651,733 |
| SE | 26° 07.4000'N | 80° 01.8333'W | 974,286 | 651,740 |

I. During transit to the Port Everglades Harbor ODMDS, the disposal vessel shall remain within the navigation channel until east of the buoy "G3".

J. The permittee shall use an electronic tracking system (ETS) that will continuously track the horizontal location and draft condition of the disposal vessel (hopper dredge or disposal barge or scow) to and from the Port Everglades Harbor ODMDS. Data shall be collected at least every 500 feet during travel to and from the ODMDS and every minute or every 200 feet of travel, whichever is smaller, while approaching within 1,000 feet and within the ODMDS. The permittee shall use Florida State Plane or latitude and longitude coordinates (North American Datum 1983). State Plane coordinates shall be reported to the nearest foot and latitude and longitude coordinates shall be reported as decimal degrees out to 6 decimals. Westerly longitudes are to be reported as negative. Draft readings shall be recorded in feet out to 2 decimals.

K. The permittee shall record electronically for each load the following information:

a. Load Number
b. Disposal Vessel or Scow Name
c. Estimated volume of Load
d. Description of Material Disposed
e. Source of Dredged Material

f. Date, Time and Location at Start at Initiation and Completion of Disposal Event
g. The ETS data required by Special Condition I.J.

L. The permittee shall conduct a bathymetric survey of the Port Everglades Harbor ODMDS within 30 days following project completion.

1. The number and length of the survey transects shall be sufficient to encompass the release zone specified in Special Condition H and a 500 foot wide area around the site. The transects shall be spaced at 500-foot intervals or less.

2. Vertical accuracy of the survey shall be ±0.5 feet. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing either microwave line of site system or differential global positioning system. The vertical datum shall be mean lower low water (m.l.l.w) and the horizontal datum shall use Florida State Plane or latitude and longitude coordinates (North American Datum 1983). State Plane coordinates shall be reported to the nearest 0.10 foot and latitude and longitude coordinates shall be reported as decimal degrees to 6 decimal points.

M. Enclosed is the Regional Biological Opinion (RBO) dated [INSERT DATE], for swimming sea turtles, whales, and sturgeon. The RBO contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the RBO. Your authorization under the Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with the incidental take of the attached RBO, which terms and conditions are incorporated by reference in the permit. Failure to comply with the terms and conditions associated with the incidental take of the RBO, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. However, depending on the affected species NMFS is the appropriate authority to determine compliance with the terms and conditions of its RBO and with the Endangered Species Act (ESA). For further clarification on this point, you should contact the appropriate agency. Should they determine that the conditions of the RBO have been violated; normally they will enforce the violation of the ESA, or refer the matter to the Department of Justice.

II. REPORTING REQUIREMENTS

A. All reports, documentation and correspondence required by the conditions of this permit shall be submitted to the following addresses: U.S. Army Corps of Engineers (Corps), Regulatory Division, Enforcement Section, P.O. Box 4970, Jacksonville, Florida 32232-0019 and U. S. Environmental Protection Agency (EPA) Region 4's Wetlands, Coastal and Oceans Branch, 61 Forsyth Street, Atlanta, GA 30303. The Permittee shall reference this permit number, [INSERT PERMIT NUMBER], on all submittals.

B. At least 15 days before initiating any dredging operations authorized by this permit, the Permittee shall provide to the Corps and EPA a written notification of the date of commencement of work authorized by this permit.

C. Electronic data required by Special Conditions I.J and I.K shall be provided to EPA Region 4 on a weekly basis. Data shall be submitted as an eXtensible Markup Language (XML) document via Internet e-mail to DisposalData.R4@epa.gov. XML data file format specifications are available from EPA Region 4.

D. The permittee shall send one (1) copy of the disposal summary report to the Jacksonville District's Regulatory Division and one (1) copy of the disposal summary report to EPA Region 4 documenting compliance with all general and special conditions defined in this permit. The disposal summary report shall be sent within 90 days after completion of the disposal operations authorized by this permit. The disposal summary report shall include the following information:

1. The report shall indicate whether all general and special permit conditions were met. Any violations of the permit shall be explained in detail.

2. The disposal summary report shall include the following information: dredging project title; dates of disposal; permit number and expiration date; name of contractor(s) conducting the work, name and type of vessel(s) disposing material in the ODMDS; disposal timeframes for each vessel; volume disposed at the ODMDS (as paid *in situ* volume, total paid and un paid *in situ* volume, and gross volume reported by dredging contractor), number of loads to ODMDS, type of material disposed at the ODMDS; identification of any misplaced material (outside disposal zone or the ODMDS boundaries); dates of pre and post disposal bathymetric surveys of the ODMDS and a narrative discussing any violation(s) of the 103 permit. The disposal summary report should be accompanied by the bathymetry survey results (plot and X,Y,Z ASCII data file).

III. PERMIT LIABILITY

A. The permittee shall be responsible for ensuring compliance with all conditions of this permit.

B. The permittee and all contractors or other third parties who perform an activity authorized by this permit on behalf of the permittee shall be separately liable for a civil penalty of up to $50,000 for each violation of any term of this permit thy commit alone or in concert with the permittee or other parties. This liability shall be individual, rather than joint and several, and shall not be reduced in any fashion to reflect the liability assigned to and civil penalty assessed against the permittee or any other third party as defined in 33 U.S.C. Section 1415(a).

C. If the permittee or any contractor or other third party knowingly violates any term of this permit (either alone or in concert), the permittee, contractor or other party shall be individually liable for the criminal penalties set forth in 33 U.S.C. Section 1415(b).

# APPENDIX C

# TYPICAL CONTRACT LANGUAGE FOR IMPEMENTING THE PORT EVERGLADES HARBOR ODMDS SMMP REQUIREMENTS

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TYPICAL CONTRACT LANGUAGE FOR IMPEMENTING SMMP REQUIREMENTS

3.3 DISPOSAL OF DREDGED MATERIAL

3.3.1 General

All material dredged shall be transported to and deposited in the disposal area(s) designated on the drawings. The approximate maximum and average distance to which the material will have to be transported are as follows:

| Disposal Area | Maximum Distance Statute Miles | Average Distance Statute Miles |
|---|---|---|
| Port Everglades Harbor ODMDS | | |
| [INSERT DISPOSAL AREA 2] | [XX miles] | [XX miles] |

[IF MATERIAL FROM DIFFERENT PROJECT AREAS GO TO DIFFERENT DISOSAL AREAS, IT COULD BE SPECIFIED HERE]

3.3.2 Ocean Disposal Notification

a. The Corps or the contractor shall notify EPA Region 4 's Wetlands, Coastal and Oceans Branch (61 Forsyth Street, Atlanta, GA 30303) at least 15 calendar days and the local Coast Guard Captain of the Port at least 5 calendar days prior to the first ocean disposal. The notification will be by certified mail with a copy to the Contracting Officer. The following information shall be included in the notification:
   (1) Project designation; Corps of Engineers' Contracting Officer's name and contract number; and, the Contractor's name, address, and telephone number.
   (2) Port of departure.
   (3) Location of ocean disposal area (and disposal zone if required).
   (4) Schedule for ocean disposal, giving date and time proposed for first ocean disposal.

3.3.3 Ocean Dredged Material Disposal Sites (ODMDS)

The material excavated shall be transported to and deposited in the Port Everglades Harbor ODMDS shown on the drawings. When dredged material is disposed, no portion of the hopper dredge or disposal barge or scow shall be outside of the boundaries of the Port Everglades Harbor ODMDS as shown on the drawings. Additionally, disposal shall be initiated within the disposal release zone defined by the following coordinates: [insert coordinates for appropriate release zone]

| Vertices | Geographic NAD 83 | | State Plane (Florida East 0901 U.S. Ft) NAD 83 | |
|---|---|---|---|---|
| | Latitude (North) | Longitude (West) | Easting | Northing |
| NW | 26° 07.9000'N | 80° 02.0000'W | 973,282 | 654,703 |
| NE | 26° 07.9000'N | 80° 01.8333'W | 974,264 | 654,711 |
| SW | 26° 07.4000'N | 80° 02.0000'W | 973,304 | 651,733 |
| SE | 26° 07.4000'N | 80° 01.8333'W | 974,286 | 651,740 |

During transit to and from the Port Everglades Harbor ODMDS, the disposal vessel shall remain within the navigation channel until east of the buoy G"3".

3.3.4 Logs

The Contractor shall keep a log for each load placed in the Port Everglades Harbor ODMDS. The log entry for each load shall include:

a. Load Number
b. Disposal Vessel or Scow Name
c. Estimated volume of Load
d. Description of Material Disposed
e. Source of Dredged Material
f. Date, Time and Location (coordinates) at Start of Initiation and Completion of Disposal Event

At the completion of dredging and at any time upon request, the log(s) shall be submitted in paper and electronic formats to the Contracting Officer for forwarding to the appropriate agencies.

3.3.5 Overflow, Spills and Leaks

Water and dredged materials shall not be permitted to overflow or spill out of barges, hopper dredges, or dump scows during transport to the disposal site(s). Failure to repair leaks or change the method of operation which is resulting in overflow of spillage will result in suspension of dredging operations and require prompt repair or change of operation to prevent overflow or spillage as a prerequisite to the resumption of dredging.

3.3.6 Electronic Tracking System (ETS) for Ocean Disposal Vessels

The Corps shall use Dredge Quality Management (DQM) to monitor dredging and dredge material disposal. The contractor shall use an Electronic Tracking System (ETS) to navigate to and from the harbor to the ODMDS. This ETS shall be established, operated and maintained by the contractor to continuously track in real-time the horizontal location and draft condition of the disposal vessel (hopper dredge or disposal barge or scow) for the entire dredging cycle, including dredging area and disposal area. The ETS shall be capable of displaying and recording in real-time the disposal vessel's draft and location per the DQM specifications. If the electronic positioning system fails or navigation problems are detected, all disposal operations shall cease until the failure or navigation problems are corrected. The contractor shall certify the accuracy of the electronic positioning system proposed for use during disposal operations. The certification shall be accomplished by providing current certification documentation from the National DQM Program for scow and hopper dredge instrumentation systems. The National DQM certification is valid for one year from the date of certification

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[USE LANGUAGE BELOW FOR NON DQM PROJECTS]

The Contractor shall furnish an ETS for surveillance of the movement and disposition of dredged material during dredging and ocean disposal. This ETS shall be established, operated and maintained by the Contractor to continuously track in real-time the horizontal location and draft condition of the disposal vessel (hopper dredge or disposal barge or scow) for the entire dredging cycle, including dredging area and disposal area. The ETS shall be capable of displaying and recording in real-time the disposal vessel's draft and location.

3.3.6.1 ETS Standards

The Contractor shall provide automated (computer) system and components to perform in accordance with COE EM 1110-1-2909. A copy of the EM can be downloaded from the following web site: http://www.usace.army.mil/inet/usace-docs'eng-manuals/em.htm. Horizontal location shall have an accuracy equal to or better than a standard DGPS system, equal to or better than plus/minus 10 feet (horizontal repeatability). Vertical (draft) data shall have an accuracy of plus/minus 0.5 foot. Horizontal location and vertical data shall be collected in sets and each data set shall be referenced in real-time to date and local time (to nearest minute), and shall be referenced to the same state plane coordinate system used for the survey(s) shown in the contract plans. The ETS shall be calibrated, as required, in the presence of the Contracting Officer at the work location before disposal operations have started, and at 30-day intervals while work is in progress. The Contracting Officer shall have access to the ETS in order to observe its operation. Disposal operations will not commence until the ETS to be used by the Contractor is certified by the Contracting Officer to be operational and within acceptable accuracy. It is the Contractor's responsibility to select a system that will operate properly at the work location. The complete system shall be subject to the Contracting Officer's approval.

3.3.6.2 ETS Data Requirements and Submissions

a. The ETS for each disposal vessel shall be in operation for all dredging and disposal activities and shall record the full round trip for each loading and disposal cycle. (NOTE: A dredging and disposal cycle constitutes the time from commencement of dredging to complete discharge of the material.) The Contracting Officer shall be notified immediately in the event of ETS failure and all dredging operations for the vessel shall cease until the ETS is fully operational. Any delays resulting from ETS failure shall be at the Contractor's expense.

b. Data shall be collected, during the dredging and disposal cycle, every 500 feet (at least) during travel to the disposal area, and every minute or every 200 feet, whichever is smaller, while approaching within 1,000 feet and within the disposal area.

c. Plot Reporting (2 types):

a. Tracking Plot - For each disposal event, data collected while the disposal vessel is in the vicinity of the disposal area shall be plotted in chart form, in 200-foot intervals, to show the track and draft of the disposal vessel approaching and traversing the disposal area. The plot shall identify the exact position at which the dump commenced.

b. Scatter Plot - Following completion of all disposal events, a single and separate plot will be prepared to show the exact disposal locations of all dumps. Every plotted location shall coincide with the beginning of the respective dump. Each dump shall be labeled with the corresponding Trip Number and shall be at a small but readable scale.

c. Summary Table – A spreadsheet which contains all of the information in the log(s) above shall be prepared and shall correspond to the exact dump locations represented on the Scatter Plot.

d. ETS data and log data required by Section 3.3.4 shall be provided to EPA Region 4 on a weekly or more frequent basis. Data shall be submitted to EPA Region 4 as an eXtensible Markup Language (XML) document via Internet e-mail to DisposalData.R4@epa.gov. XML data file format specifications are available from EPA Region 4. All digital ETS data shall be furnished to the Contracting Officer within 24 hours of collection. The digital plot files should be in an easily readable format such as Adobe Acrobat PDF file, Microstation DGN file, JPEG, BMP, TIFF, or similar. The hard copy of the ETS data and tracking plots shall be both maintained onboard the vessel and submitted to the Contracting Officer on a weekly basis.

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[FOR DQM PROJECTS]

See: http://dqm.usace.army.mil/Specifications/Index.aspx

For scows, the monitoring profile, TDS profile or Ullage profile shall be used.

3.3.6.3 Misplaced Materials

Materials deposited outside of the disposal zone specified in 3.3.3 will be classified as misplaced material and will result in a suspension of dredging operations. Redredging of such materials will be required as a prerequisite to the resumption of dredging unless the Contracting Officer, at his discretion, determines that redredging of such material is not practical. If redredging of such material is not required then the quantity of such misplaced material shall be deducted from the Contractor's pay quantity. If the quantity for each misplaced load to be deducted cannot initially be agreed to by both the Contractor and Contracting Officer, then an average hopper/scow load quantity for the entire contract will be used in the determination. Misplaced loads may also be subject to penalty under the Marine, Protection, Research and Sanctuaries Act. Materials deposited above the maximum indicated elevation or outside of the disposal area template shown will require the redredging or removal of such materials at the Contractor's expense. In addition, the Contractor must notify the Contracting Officer and the Environmental Protection Agency Region 4 's Wetlands, Coastal and Oceans Branch (61 Forsyth Street, Atlanta, GA 30303) within 24 hours of a misplaced dump or any other violation of the Site Management and Monitoring Plan for the Port Everglades Harbor ODMDS. Corrective actions must be implemented by the next dump and the Contracting Officer must be informed of actions taken.

# APPENDIX E.

## COASTAL ZONE MANANAGEMENT CONSISTENCY DETERMINATION



**DRAFT ENVIRONMENTAL ASSESSMENT**
**ON THE**
**EXPANSION OF THE PORT EVERGLADES HARBOR**
**OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)**
**BROWARD COUNTY, FLORIDA**

# FLORIDA COASTAL ZONE MANAGEMENT PROGRAM
# FEDERAL CONSISTENCY EVALUATION

## DESIGNATION OF AN OCEAN DREDGED MATERIAL DISPOSAL SITE OFFSHORE OF PORT EVERGLADES FLORIDA

**JUNE 2013**

The purpose of this document is to request the State of Florida's agreement with the enclosed federal consistency determination for the proposed expansion of an existing Ocean Dredged Material Disposal Site (ODMDS) off the coast of Ft. Lauderdale, Florida for disposal of dredged material associated with planned Port Everglades Harbor expansion and regular maintenance activities. This work includes deepening of the entrance channel from -45 mean lower low water line (MLLW) to -57 MLLW and all other channels within the port to -50 MLLW.

The 1972 Coastal Zone Management Act (CZMA) was enacted to encourage coastal states to proactively manage their natural resources. Consistent with CZMA's provisions, the State of Florida developed and obtained approval of its coastal management program (CMP) in 1981. The State's CMP consists of a network of 24 Florida Statutes administered by nine state agencies and five water management districts. The Offshore Projects Unit, located in the Florida Department of Environmental Protection's Office of Intergovernmental Programs, coordinates consistency review of those federal activities proposed in offshore waters, i.e., this proposed ODMDS expansion off the southeast coast of Florida in the Atlantic Ocean.

Federal consistency is the CZMA provision where those federal actions having reasonably foreseeable effects on any land or water use or natural resource of the coastal zone should be consistent with the enforceable policies of a coastal state's federally approved CMP. CZMA defines four types of federal actions: 1) federal agency activities, 2) federal license or permit activities, 3) outer continental shelf (OCS) plans, and 4) federal assistance to state and local governments.

**Federal Agency Action**
CZMA defines federal agency activities as those activities, including development projects, performed by a federal agency, or a contractor for the benefit of a federal agency (15 C.F.R. Part 930, subpart C.). The proposed action is the expansion of the existing ODMDS. MRPSA section 102 authorizes EPA to designate/expand sites however use of the site in not limited to only USACE.

USACE Jacksonville District has requested that the U.S. Environmental Protection Agency Region 4 (EPA) expand the existing Port Everglades ODMDS offshore of Ft. Lauderdale, Florida for the disposal of dredged material primarily from deepening and maintenance dredging of Port Everglades Harbor. As part of the original Port Everglades ODMDS site designation completed in July 2004, the Florida Coastal Zone Consistency Program conducted a consistency review and found the site desination by USEPA to be consistent with the Florida Coastal Zone Management Program.

**Purpose**

The purpose of the proposed action (expansion of the existing ODMDS) is to ensure that adequate environmentally acceptable and economically and logistically feasible ocean disposal site capacity is available for the next 50 years for suitable dredged material generated from new projects and maintenance dredging in the vicinity. This site will be used for the disposal of suitable dredged material primarily from the deepening and maintenance dredging of Port Everglades Harbor. The expansion of the Port Everglades ODMDS is needed to support planned expansion of the Port, ongoing maintenance, and capital improvement projects which are important for continued economic growth of vital commercial and recreational areas in the region.

As part of the ODMDS site expansion process, initial screening of study areas was conducted based on environmental, operational, and economic criteria to identify viable alternative sites that were evaluated in more detail during site designation studies. Two similar alternatives (Alternative Site 1 and Alternative Site 2) were considered for this project. Alternative 1, a 3.21 sq. nmi. (2,721 acres) site has a north-south oriented release zone and is the environmentally and operationally preferred alternative. The western edge of the site is located approximately 3.3 nmi (6.1 km) offshore and the center of the site is located approximately 4.0 nmi (7.4 km) offshore. Water depths range from 604 to 735 feet (184 to 224 meters). Alternative 1 is both the preferred alternative and the environmentally preferred alternative. Alternative Site 2, a 2.89 sq. nmi. (2,449 acre) site has an east-west oriented release zone. The western edge of the site is located approximately 3.2 nmi (5.9 km) offshore and the center of the site is located approximately 3.9 nmi (7.2 km) offshore. Water depths range from 604 to 735 feet (184 to 224 meters). Both sites are evaluated here for determination of consistency with the CZMA.

**Florida Coastal Management Program (FCMP)**

The FCMP Act, adopted in 1978, authorized the development of a coastal management program. The FCMP was approved by the National Oceanic and Atmospheric Administration (NOAA) in 1981. It consists of a network of 24 Florida statutes administered by eight state agencies and the five water management districts. The program is designed to ensure the wise use and protection of the state's water, cultural, historic, and biological resources to minimize Florida's vulnerability to coastal hazards; to ensure compliance with Florida's growth management laws; to protect Florida's transportation system; and to protect Florida's proprietary interest as the owner of sovereign submerged lands.

**Analysis of Florida Coastal Management Program Statutes**

Each of the 26 Florida statutes related to Florida's coastal zone are listed below and evaluated for applicability to the expansion of the existing ODMDS off the coast of Ft. Lauderdale, Florida. When applicable, the project's consistency with these statutes is discussed. The state coastal zone that may potentially be affected by the proposed action is limited to coastal waters of the Atlantic Ocean from the mean high water line to 3 nmi (6 km) offshore.

Chapter 161—Beach and Shore Preservation
This policy authorizes the Bureau of Beaches and Coastal Systems within the Florida Department of Environmental Protection (FDEP) to regulate construction on or seaward of Florida's beaches.

> **Consistency Statement***: The proposed action occurs in federal offshore waters and does not affect state regulation of construction on or seaward of Florida's beaches. Indirectly, some beach quality sand suitable for use on Florida's beaches could be deposited in the ODMDS. However segregating this sand from the disposal material is not cost effective and thus has not been considered as an alternative. This policy is not applicable.*

Chapter 163, Part II—Growth Policy, County and Municipal Planning, Land Development Regulation This policy requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.

> **Consistency Statement**: *The proposed action is consistent with this statute because all activity is seaward and outside of Florida's coastal waters. In addition the Broward County Port Everglades Department has determined that port expansion will be required and that an expanded ODMDS will be necessary to accommodate future disposal events; therefore, this policy is not applicable to the proposed action. It is also likely that an expansion is necessary to handle the on-going O&M material being removed from the port associated with ongoing maintenance activities.*

Chapter 186—State and Regional Planning
This statute details state-level planning requirements. It requires the development of special statewide plans governing water use, land development, and transportation.

> **Consistency Statement**: *The proposed action does not include any development of plans to govern water use, land development, or transportation; therefore, this policy is not applicable to the proposed action.*

Chapter 252—Emergency Management
This policy provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.

> **Consistency Statement**: *The proposed action would not increase Florida's vulnerability to natural disasters. The expansion of an existing ODMDS will not hinder the state's efforts in managing the vulnerability of the citizens or property in the vicinity of the proposed action. Assurance of sufficient disposal site capacity is consistent with the goals of the Division of Emergency Management by assuring that emergency dredging could take place within the constraints of existing regulations of the transport and placement of disposal material. The proposed action would be consistent with the efforts of the Division of Emergency Management.*

Chapter 253—State Lands

This statute addresses the State's Conceptual State Lands Management Plan – the intent of which is to guide state land management to provide maximum benefit and use (balanced public use) of each parcel. Items of interest include 1) location, evaluation, and protection of archaeological and historical resources; 2) water resources; 3) fish and wildlife resources; 4) beaches and dunes; 5) submerged grass beds and other benthic communities; 6) swamps, marshes, and other wetlands; 7) mineral resources; 8) unique natural features; 9) submerged lands; 10) spoil islands; and 11) artificial reefs.

> **Consistency Statement**: *The project area lies entirely within federal waters and all operations are to be within the constraints of existing regulations; therefore, impacts to state-owned or sovereign submerged lands are not expected with the proposed action.*

Chapter 258—State Parks and Preserves

This policy addresses administration and management of state parks and preserves.

> **Consistency Statement**: *The proposed action does not include any activity within a state park or aquatic preserve. No reasonably foreseeable significant impacts to state parks or aquatic preserves are expected as a result of implementation of the proposed action; therefore, the proposed action is consistent with this chapter.*

Chapters 259—Land Acquisition for Conservation and Recreation

This policy authorizes acquisition of environmentally endangered lands and outdoor recreation lands.

> **Consistency Statement**: *Due to the offshore location of the ODMDS, the proposed action would not affect any land acquisition for conservation and recreation; therefore, this policy is not applicable.*

Chapter 260—Florida Greenways and Trails Act

This policy authorizes acquisition of land to create a recreational trails system and to facilitate management of the system.

> **Consistency Statement**: *Due to the offshore location of the ODMDS, the proposed action would not affect any land acquisition for recreational trails; therefore, this policy is not applicable.*

Chapter 267—Historical Resources

This policy addresses management and preservation of Florida's archaeological and historical resources.

> **Consistency Statement**: *Coordination with the State Historic Preservation Officer (SHPO) was initiated in August 2011 and is ongoing until the completion of the project. A submerged cultural resources survey was conducted in September 2011, resulting in the report, "Cultural Resources Remote Sensing Survey of the Port Everglades Channel and Ocean Dredged Material Disposal Site (ODMDS) Broward County, Florida." One magnetometer anomaly and two sidescan contacts, comprising two targets, were identified and considered to be potentially indicative of historic properties (i.e. shipwrecks) within the*

*ODMDS project area. Both of these targets have been recommended for avoidance, and if not feasible, further investigation to determine if they represent significant historic properties.*

Chapter 288—Commercial Development and Capital Improvements
This policy provides the framework for promoting and developing the general business, trade, and tourism components of the state economy.

**Consistency Statement**: *The proposed action would not directly involve any commercial development or capital improvements that would affect the business, trade, or tourist components of the state economy; however, this action may indirectly facilitate port expansion by increasing dredged material disposal capacity which is needed for planned deepening and expansion of Port Everglades Harbor. These activities would promote development of the general business, trade, and tourism components of the state economy.*

Chapter 334—Transportation Administration
This policy addresses the state's policy concerning transportation administration.

**Consistency Statement**: *The proposed action would not affect upland transportation; therefore, this policy is not applicable.*

Chapter 339—Transportation Finance and Planning
This statute addresses the finance and planning needs of the state's transportation system.

**Consistency Statement**: *The proposed action would not directly affect transportation; however, this action may indirectly facilitate port expansion by increasing dredged material disposal capacity which is needed for planned deepening and expansion of Port Everglades Harbor. These activities would promote development of the general business, trade, and tourism components of the state economy.*

Chapter 373—Water Resources
This policy addresses the state's policy concerning water resources.

**Consistency Statement**: *The expansion of the ODMDS would be consistent with coastal water quality policies. The MPRSA § 103(b) and 40 CFR § 227.13 of the Ocean Dumping Regulations requires that dredged materials be evaluated prior to disposal in ocean waters and be found to be environmentally acceptable for ocean dumping. Therefore, the proposed action is consistent with this policy.*

Chapter 375—Outdoor Recreation and Conservation Lands
This statute authorizes the State of Florida to acquire lands, water areas, and related resources for outdoor recreation and conservation.

**Consistency Statement**: *The expansion of the existing ODMDS would not affect the development of a comprehensive multipurpose outdoor recreation plan that documents recreational supply and demand, describes current recreational opportunities, estimates* *need for additional recreational opportunities, and proposes means to meet the identified needs. Therefore, this statute is not applicable.*

Chapter 376—Pollutant Discharge Prevention and Removal
This policy regulates transfer, storage, and transportation of pollutants and cleanup of pollutant discharges.

> **Consistency Statement**: *The expansion of the existing ODMDS does not involve the discharge of pollutants to estuarine or marine waters; however, the site would be used during dredging projects for the placement of suitable dredged material. All operations are to be within the constraints of existing regulations and approval for individual dredging projects would be contingent upon adherence to applicable federal regulations concerning the transport and disposal of dredged material. Therefore, the proposed action is consistent with Chapter 376.*

Chapter 377—Energy Resources
This statute addresses regulation, planning, and development of energy resources of the state.

> **Consistency Statement**: *The proposed action would not affect regulation, planning, or development of energy resources; therefore, this policy is not applicable.*

Chapter 379 – Fish and Wildlife Conservation
This statute provides a framework for management and protection of the State of Florida's wide diversity of fish and wildlife resources. The enforceable policies contained in this statute authorize the Florida Fish and Wildlife Conservation Commission (FWC) to manage and protect the state's marine life, freshwater aquatic life, and wild animal life. It is the policy of the state to conserve and wisely manage these resources. Particular attention is given to those species defined as being endangered or threatened.

> **Consistency Statement**: *The proposed action is not expected to significantly affect wildlife. Since the proposed action is several miles offshore, impacts to state and federal listed species are limited to species that may occur this far offshore. These species include the listed sea turtles and whales. There is a potential for collisions with sea turtles and the endangered whale species that might move through the proposed ODMDS expansion site. However, because these species are highly motile, no impacts are anticipated. Further, protective measures will be implemented to reduce the risk of vessel strikes as dredges and barges are transiting to and from the disposal site. The proposed action would be consistent with this policy.*

Chapter 380—Land and Water Management
This policy establishes land and water management policies to guide and coordinate local decisions relating to growth and development.

> **Consistency Statement**: *The proposed action occurs in federal offshore waters and does not affect state land and water management policies; therefore, this policy is not applicable.*

Chapter 381—Public Health, General Provisions

This statute relates to public policy concerning the state's public health system.

> **Consistency Statement**: *The proposed action does not involve the construction of an on-site sewage treatment and disposal system; therefore, this policy is not applicable.*

Chapter 388—Mosquito Control

This statute addresses mosquito control efforts in the state.

> **Consistency Statement**: *The proposed action occurs in federal offshore waters and does not affect state land and water management policies; therefore, this policy is not applicable.*

Chapter 403—Environmental Control

This statute establishes public policy concerning environmental control in the state.

> **Consistency Statement**: *USACE and EPA will evaluate all federal dredged material disposal projects in accordance with criteria given in the Ocean Dumping Regulations (40 CFR 220-229), the USACE regulations (33 CFR 209.120 and 209.145), and any state requirements. USACE will also issue permits to private dredged material disposal projects after review under the same regulations. EPA has the right to disapprove any ocean disposal project if, in its judgment, all provisions of the Marine Protection, Research, and Sanctuaries Act and associated implementing regulations have not been met. These regulations are consistent with enforceable policies of the state; therefore, the proposed action is consistent with this chapter.*

Chapter 553 – Building Construction Standards

This statute is known as the Florida Building Codes Act and addresses building construction standards and provides for a unified Florida Building Code.

> **Consistency Statement**: *The proposed action occurs in federal offshore waters and does not involve the construction of buildings; therefore, this policy is not applicable.*

Chapter 582—Soil and Water Conservation

This policy provides for the control and prevention of soil erosion.

> **Consistency Statement**: *The proposed action occurs in federal offshore waters and is not located near agricultural lands; therefore, this policy is not applicable.*

Chapter 597 – Aquaculture

This statute is known as the Florida Aquaculture Policy Act and establishes public policy concerning the cultivation of aquatic organisms in the state.

> **Consistency Statement**: *The proposed action occurs in federal offshore waters and does not involve aquaculture; therefore, this policy is not applicable.*

**Conclusion**

The proposed action as described in the project EA is consistent to the maximum extent practicable with the enforcable policies of the above-mentioned Florida statutes.